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NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

MBA PROFESSIONAL REPORT

ASSESSMENT OF LOGISTICAL SUPPORT FOR EXPEDITIONARY UNITS

**By: Suneet Kundra,
Lamont Brown, and
Charles Donaldson
June 2014**

**Advisors: Keebom Kang
Uday Apte**

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ASSESSMENT OF LOGISTICAL SUPPORT FOR EXPEDITIONARY UNITS

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Submitted in partial fulfillment of the requirements for the degree of

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ASSESSMENT OF LOGISTICAL SUPPORT FOR EXPEDITIONARY UNITS

ABSTRACT

The purpose of this MBA Professional Report is to study the current state of expeditionary logistical support in the Navy and to identify logistical challenges faced in expeditionary environments. Expeditionary supply chain or logistics refers to the activities and capabilities needed to provide operational units in an expeditionary environment with services and supplies such as fuel, food, water, ammunition, etc. An expeditionary supply chain also includes responsibilities such as establishment of ports of embarkation and debarkation, container management, financial management, and inventory and distribution management.

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LIST OF ACRONYMS AND ABBREVIATIONS

AC	Active Component
ADCON	administrative control
AFRICOM	U.S. Africa Command
AFSOC	Air Force Special Operations Command
AOR	area of responsibility
ATFP	Anti-Terrorism Force Protection
C2	command and control
C5F	Commander Fifth Fleet
C6F	Commander Sixth Fleet
C7F	Commander Seventh Fleet
CA	civil affairs
CBRNE	Chemical, Biological, Radiological, Nuclear, and High Yield Explosive
CJSOTF	Combined Joint Special Operations Task Force
CNSWC	Commander, Naval Special Warfare Command
CO	Commanding Officer
COMCAM	Combat Camera
COMNECC	Commander, Navy Expeditionary Combat Command
CONUS	Continental United States
CS	Combat Support
CSS	Combat Service Support
CSST	Naval Special Warfare Combat Service Support Teams
CTF	Combined Task Force
DOD	Department of Defense
ECRC	Expeditionary Combat Readiness Center
EOD	Explosive Ordnance Disposal
ESD	Expeditionary Support Departments
ESU	Expeditionary Support Units
ETC	Expeditionary Training Command
FTN	Force Tracking Number

GCPC	Government Commercial Purchase Card
GWOT	Global War on Terrorism
HA/DR	Humanitarian Assistance and Disaster Relief
HN	Host Nation
HVA	High Value Asset
IED	Improvised Explosive Device
IO	Information Operations
ISU	Individual Storage Unit
JEB	Joint Expeditionary Base
JEBLCFS	Joint Expeditionary Base Little Creek- Fort Story
JSOC	Joint Special Operations Command
LOGSU	Logistics and Support Units
LSC	Logistics Specialists Chief
MARSOC	Marine Corps Forces Special Operations Command
MCT	Mobile Communications Team
MDS	Mobile Diving and Salvage
N4	Naval Logistics Department
NAVELSG	Navy Expeditionary Logistics Support Group
NAVSOC	U.S. Naval Special Warfare Command
NAVSPECWARCOM	Naval Special Warfare Command
NCF	Naval Construction Forces
NECC	Navy Expeditionary Combat Command
NSW	Naval Special Warfare Command
NSWC	Naval Special Warfare Center
NSWG	Commander, Naval Special Warfare Group
O-6	Captain (USN)
O-5	Lieutenant Commander (USN)
OCO	Overseas Contingencies Operations
PGI	Personal Gear Issue
RC	Reserve Component
RHIB	Rigid-Hull Inflatable Boats
RIVGRU	Riverine Group

SBT	Special Boat Teams
SDV	SEAL Delivery Vehicle
SDVT	SEAL Delivery Vehicle Teams
Seabees	Naval Construction Battalions
SEAL	Sea, Air, and Land
SECNAV	Secretary of the Navy
SMU	Special Mission Unit
SOCAFRICA	Special Operations Command for Africa
SOCCENT	Special Operations Command Central
SOCEUR	Special Operations Command Europe
SOCJFCOM	Special Operations Command- Joint Forces Command
SOCKOR-	Special Operations Command Korea
SOCOM-	U.S. Special Operations Command
SOC PAC-	Special Operations Command Pacific
SOC SOUTH-	U.S. Southern Command
SOF-	Special Operations Forces
SWCC	Special Warfare Combatant-craft Crewmen
TSOC	Theater Special Operational Command
TYCOM	Type Commander
USCENTCOM	United States Central Command
USEUCOM	United States European Command
USSOCOM	United States Special Operations Command

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I. INTRODUCTION

A. BACKGROUND

The aim of the Navy's warfighting capability has long been to win wars at sea. In recent decades, however, the U.S. has engaged in conflicts that involved countering threats from non-traditional actors. These conflicts were conducted on inland battlefields against non-state actors or insurgency movements, both of which employed terrorism and terrorist techniques to disrupt coalition foreign policy and nation building efforts (Farmer, 2011). America's powerful maritime force could not directly counter these opponents. Nevertheless, the magnitude of the effort required the Navy to play a direct supporting role through its expeditionary warfare and Naval Special Warfare Command (NSW) capabilities. While the Navy's primary focus will remain on its maritime capabilities, the trend described above is expected to continue in the foreseeable future and the Navy's role in these efforts is likely to endure (Department of Defense, 2014).

Coincident with this new demand for expeditionary warfighting capability is an increasing fiscal burden placed upon the nation's finances. Accompanying this is political pressure among the nation's lawmakers to resolve the problem through the passage of balanced budgets and the restoration of sustainable fiscal policy. In 2013, this fiscal and political atmosphere and the inability of lawmakers to agree on targeted budget cuts resulted in across-the-board cuts to discretionary spending of all Federal departments. The DOD was not exempted. The indiscriminate nature of these cuts has been frequently criticized as a crude and inappropriate technique. The effect is that costs are reduced without regard to the corresponding programs' benefits or the consequences that could result from their elimination (Feickert, 2013). The counterargument these critics (Feickert, 2013) make is that cuts should be targeted thoughtfully to those areas that will yield the greatest benefit to the taxpayer and at the least cost; however, to do this effectively, these areas must be identified. This research seeks to assist in this identification by addressing the following questions.

B. RESEARCH QUESTIONS

This study was initiated by the Office of Naval Research (ONR) in response to a perceived lack of academic research in the area of Navy Expeditionary Logistics (EXLOG). The results of the literature review conducted in the course of this report largely confirmed that perception. The review found there was previous research performed in the area of EXLOG; however, the academic works are relatively few in number and are limited in scope (Tessier, Nilsen, Lugo, & Perez, 2004; Applegate, 2006). The primary purpose of those research reports was to examine and report upon a particular problem or incident. The findings were informative. Whether taken individually or collectively, however, the prior research reports were unable to provide the comprehensive understanding of EXLOG that is the goal of the ONR initiative. If the Navy is to continue to be a relevant contributor on the main fronts of the nation's Global War on Terror, the authors of this study believe that understanding EXLOG and carrying it out in an efficient and effective manner are vital.

This research project therefore intends to define, answer, and/or clarify questions such as:

- What are the role and responsibilities of the Expeditionary Support Units?
- What is the current state of Expeditionary Logistics Processes?
- What are the Supply chain and Logistical processes currently being used in expeditionary environments?
- What are some of the logistical challenges being faced in the current expeditionary environment?
- What recommendations can be made for improving Expeditionary Logistics Processes?

C. SCOPE AND ORGANIZATION OF RESEARCH

This report is intended to serve both as a stand-alone report on the logistics support operations of the Navy Explosive Ordnance Disposal (EOD) and Naval Special

Warfare (NSW) communities and, also, as one of a series of studies examining various aspects of the operation of Navy and Marine expeditionary logistics.

This is to be the first of a series of several similar reports coordinated by the ONR to study the operations of Navy and Marine expeditionary units. Individually, the aim of each of these reports will be similar to this one: to provide a critical assessment of the logistics business practices in a particular community (or communities) and to provide lessons learned and recommendations for ways these areas may be improved and made more cost effective.

1. Purpose

When read as an independent work, this study can be viewed as a critical assessment of the logistics business practices in the Navy Explosive Ordnance Disposal (EOD) and Naval Special Warfare (NSW) communities.

When viewed in the context of a series of reports, this report is intended to contribute to the formation of a composite picture of the operation of EXLOG operations as a whole. This integrated understanding will enable a comprehensive understanding of the range of EXLOG logistics business practices being employed. It will also permit a critical, comparative assessment of these practices with the goal of identifying areas of improvement and potential cost savings. The benefit of integrating these various reports is the perspective gained. This will also enable an informed comparison of the communities concerned that could yield additional cost savings through potential standardization across communities.

2. Benefits and Limitations

Because of the long-standing focus on a traditional maritime naval force, it is hardly surprising the majority of academic inquiries are directed towards the Navy's core competencies; while relatively little research has been directed toward EXLOG (Applegate, 2006; Tessier et al., 2004). While this may have been acceptable in the past, a number of factors make the study of EXLOG an important area of current research. In the coming decades, it will yield benefits for the nation.

This report will identify and discuss a number of factors that currently contribute to the sub-optimization of EXLOG operations. The leadership and personnel of this community have, however, been successful in achieving their mission. This success, in conjunction with a lack of readily available cost and logistics information, may have created an inaccurate, optimistic picture of the effectiveness of the cutbacks which have been implemented thus far. Without the ability to clearly communicate what impact the cutbacks have had, and to accurately and systematically report opportunity costs, tradeoffs, and secondary effects, the EXLOG community has become a victim of its own success.

This research is important to the Navy and to the nation because of the potential to realize financial efficiencies and operational effectiveness through standardization of business practices and the optimization of supply chains and inventory management systems. Our research indicated that EOD Logistics Support Units and NSW Logistical supports have no single standard inventory management system. Both units have employed ad hoc methods to manage their inventories; EOD relies on a stand-alone commercial off-the-shelf inventory management system to manage its warehouse; whereas, NSW uses multiple systems to do the same. Unfortunately, the individual systems are not compatible (EODESU1, 2014). While more detailed analysis is required, it is likely that each system's readiness capability comes through the accumulation and retention of redundant spare parts and pieces of equipment (EODESU1, 2014). These buffers are necessary to ensure readiness. They also represent the symptoms of an unresponsive supply chain: lack of inventory management training, heavy use of non-standard requisition processes, and loss of accountability. They also represent significant financial investments that might be eliminated through an improved inventory management system (EODESU1, 2014). This is one of the main areas of potential improvement that we discovered and which we will describe in our report. The potential for cost savings, however, exists in many other areas of the EXLOG community.

3. Methodology

The information that served as the basis of this report was gathered from key personnel during face-to-face interviews at the logistics support commands for NSW and EOD as well as phone conversations and email exchanges. These individuals included senior personnel: commanding officers and their deputies and civilian and military subject matter experts. The information and perspective gained during the course of these interviews is presented in the form of two hypothetical yet realistic case studies. These case studies summarize and present the business operations of the units using a hypothetical scenario and fictionalized personnel, equipment, and data. The purpose of using this case study approach is to illustrate the processes in a succinct narrative format that will make the logistics processes more intuitively understandable while making their strengths and weaknesses more readily apparent.

D. LITERATURE REVIEW

There have been previous research projects which have focused on expeditionary logistics. Our research team reviewed prior research reports in order to understand material that was applicable to this study's research. Our team built upon their findings where possible and avoided duplicate efforts when practical. For the most part, the team judged these reports to be applicable and their findings valuable for this study's research. These reports and their findings will be summarized along with an analysis of why their findings may or may not be applicable to this current research effort.

The reports which were reviewed in preparation for this report did not have EXLOG as the sole area of concern; rather, they focused on varied but more limited areas of operation. For example, one research focused on the assessment of the spectrum—the largest expeditionary logistics within a single AOR (Tessier et al., 2004). At the opposite end, another report (Committee on Naval Expeditionary Logistics, 1999) focused on the newly established model for the Marines Corps—Operational Maneuver from the Sea (OMFTS). These reports, however, did yield valuable insights into their selected areas of research. It was noted that although there was little overlap between these areas, there were many common themes running through their analyses, findings, and

recommendations. This implicitly suggested the same goal as that of the overarching ONR research project which this research team believes may reveal similar common themes and lead to significant efficiencies and cost savings.

The most comprehensive study was conducted by the National Research Council (NRC) to “determine the technological requirements, operational changes, and combat service support structure necessary to land and support forces ashore under the newly evolving Navy and Marine Corps doctrine” (Committee on Naval Expeditionary Logistics, 1999). The NRC appointed The Committee on Naval Expeditionary Logistics (CNEL) and gave it a threefold mission (Committee on Naval Expeditionary Logistics, 1999):

- (1) Evaluate the packaging, sealift, and distribution network; and identify critical nodes and operations that affect timely insertion of fuels, ammunition, water, medical supplies, food, vehicles, and maintenance parts and tool blocks;
 - (2) Determine specific changes required to relieve these critical nodes and support forces ashore, from assault through follow-on echelons; and
 - (3) Present implementable changes to existing support systems; and suggest the development of innovative new systems and technologies to land and sustain dispersed units from the shoreline to 200 miles inland.
- (p. vii)

At the time the stated study was conducted, OMFTS was a relatively new doctrine the Marine Corps had implemented. This was intended to overhaul the methods by which Marine Corps conducted logistics and other expeditionary functions by leveraging sea-lanes to its advantage; then subsequently deploying Naval expeditionary forces and fire power directly from the sea to missions up to 400 miles inland (Committee on Naval Expeditionary Logistics, 1999). Because the doctrine was newly implemented, however, one of the first conclusions the CNEL reached was that OMFTS was not well established enough to enable them to answer their questions. Consequently, the committee recommendations included focusing on core logistical functions of force deployment, sustainment, medical support, or any basic logistical issue related to these core functions.

The CNEL report provides many recommendations. These are in line with its focus on OMFTS and expeditionary logistics as specifically conducted by the Marine

Corps. Because of the specific nature of the report's focus, many of these recommendations are not germane to the scope of this report. Several recommendations, however, do suggest the possibility that the alignment of expeditionary logistics procedures exists and the overarching ONR research project may yield further insight and potential cost savings through logistics efficiencies. Some of these recommendations include (Committee on Naval Expeditionary Logistics, 1999):

- The Navy and Marine Corps should work together to craft a common approach to the resupply of all naval forces at sea. (p. 9)
- The Navy and Marine Corps should create an end-to-end, OMFTS logistics concept that supports the concept of operations at each stage in the iterative process of defining future forces and their capabilities. (p. 10)
- The Navy and Marine Corps, using an iterative, strategic planning process, should create an OMFTS concept of operations that integrates tactical and logistical considerations. (p. 24)

Another report entitled “Logistics Support of Naval Expeditionary Units” was based on a study that evaluated NAVCENT logistical systems. It was conducted by four graduate students at the Naval Postgraduate School. The report focused on the supportive roles performed by naval expeditionary units (i.e., Naval Construction Forces (NCF), Naval Special Warfare (NSW) forces, Explosive Ordnance Disposal (EOD) units, and Fleet Hospitals). It evaluated the adequacy and efficiency with which theater logistics capabilities were able to satisfy the requirements of the expeditionary units (Tessier et al., 2004). A key finding of the report was that the NAVCENT logistical systems were “adequate, but inefficient” (Tessier et al., 2004) of operation, but the inefficiencies were due to lack of procedural compliance. Further conclusions pointed out the importance for expeditionary forces to have practical experience of typical logistical systems used within the geographical AOR. It was also deemed important that, prior to entering geographical theater, the expeditionary forces familiarize themselves with the organizations and structures of in-theater logistics systems’ and authorities’ and responsibilities (Tessier et al., 2004).

The third report entitled “Naval Expeditionary Logistics: A Handbook for Complementing and Supporting Land Forces” was prepared by another NPS student

(Applegate, 2006). This project provided many recommendations, but its main product was the creation of a remarkably comprehensive “how-to” procedure for U.S. Navy logisticians who belong to, or who support, U.S. naval expeditionary forces (Applegate, 2006). The report explored how the Navy had historically highlighted traditional warfighting platforms, but, in the same manner as traditional Navy units, had looked away from expeditionary combat forces. The report found that a lack of essential guidance for, or experience in, a joint environment prevented the understanding and implementation for expeditionary logistics procedures. Each community adopted its own perception and methodology in preparation and deployment support. This fostered an environment with multiple meanings for the same objectives. It also highlighted the need for uniformity of doctrine and procedure within the expeditionary communities and that they would operate within similar guidelines (Applegate, 2006). These and further training recommendations reflected those made by the previous team with regard to the CENTCOM AOR. These suggested the possibility that improvements may be realized in this area through standardization across communities.

Ultimately, each research project sought out and defined an aspect of the expeditionary logistic spectrum in terms of identifying the need for either improvement in the process for logistical support or of creating a “how to” guide to understand the unique logistics requirements of expeditionary forces. The focus of this paper’s present research project will build upon this body of knowledge and explore within specific commands that make up NECC and NSW. With understanding the need to conduct and sustain military actions beyond the capability of conventional military forces, this research project intends to further explore the meaning of Expeditionary Logistics from a naval perspective. Within the financial budget process, it will point out how both EOD and NSW units are funded and how in some ways they are better funded compared to traditional naval forces. This is due to the nature of their missions. Compared to previous research, this would be considered a step forward.

II. NAVY EXPEDITIONARY FORCES

U.S. Navy Expeditionary Forces are comprised of two commands: Navy Expeditionary Combat Command (NECC) and Naval Special Warfare Command (NSW). Established in January 2006, NECC is an Echelon III command under U.S. Fleet Forces Command (USFFC). NSW was commissioned in 1987 and falls under U.S. Special Operations Command (USSOCOM).

A. NAVY EXPEDITIONARY COMBAT COMMAND

The Navy Expeditionary Combat Command's (NECC) primary mission is to provide combat ready units for expeditionary missions to the Joint Coalition Force Maritime Component Command (JFMCC) and Navy Unified Combatant Command (COCOM). NECC's forces operate in a wide range of maritime environments. This includes the littoral and inland zones such as harbors, inland waterways, ports, and rivers.

Navy Expeditionary Combat Command (NECC) serves as the single functional command for the Navy's expeditionary forces. It also serves as central management for the readiness, resources, manning, training, and equipping of those forces. Expeditionary forces are organized to accomplish specific objectives in other countries (NECC, 2014).

1. Navy Expeditionary Combat Command Capabilities

NECC is comprised of ten subordinate commands (see Figure 1) that provide twelve unique capabilities that support U.S. and allied expeditionary forces in various missions inland and at sea. These capabilities were created based on post 9/11 threats to U.S. national security. These capabilities are: Maritime Expeditionary Security Forces, Explosive Ordnance Disposal, Expeditionary Engineering and Construction, Mobile Diving and Salvage, Expeditionary Logistics, Riparian Forces, Maritime Civil Affairs, Expeditionary Combat Readiness and Training, Combat Camera, Expeditionary Intelligence, and Guard Battalion and Individual Augmentee Preparedness (NKO, 2014).

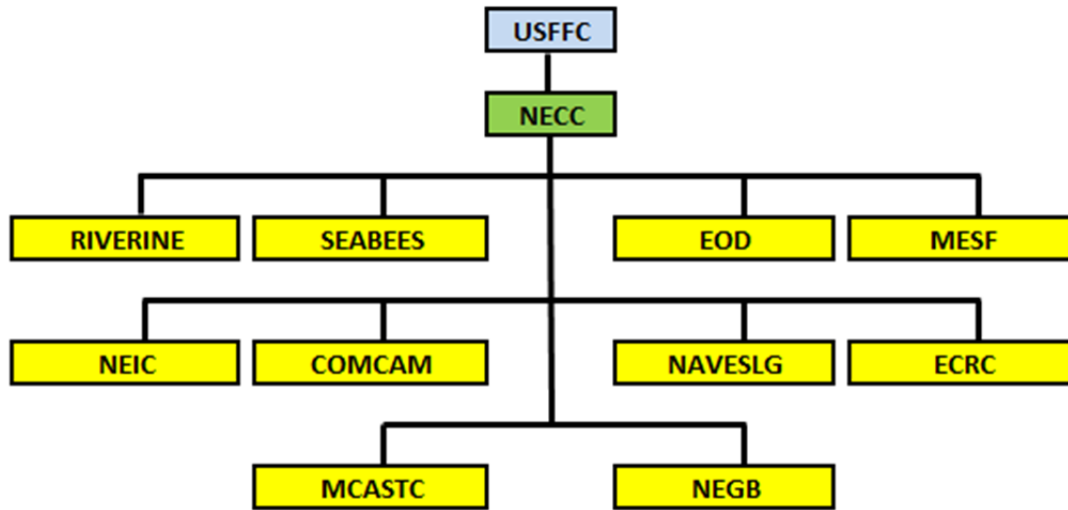


Figure 1. NECC Subordinate Command (from NKO, 2014).

NECC falls under U.S. Fleet Forces Command (USFFC). NECC’s Subcommand capabilities allow it to be a versatile force ready to meet the challenges of its operational environments. Brief descriptions and the capabilities of NECC’s ten subordinate commands are shown in Figure 1, whereas the relative sizes of subordinate commands, as percentage of total size of NECC, are shown in Figure 2. As of 2014, the total number of personnel in NECC is approximately 29,000 (NKO, 2014).

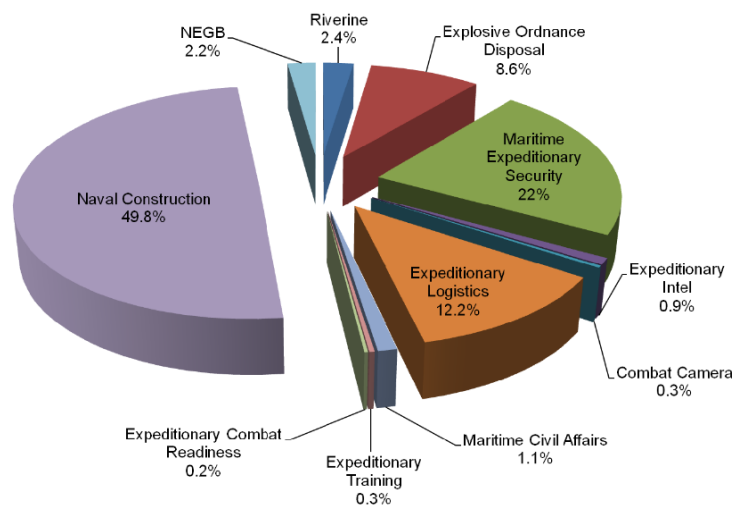


Figure 2. NECC Force Breakdown (from NKO, 2014).

a. Riverine

Coastal Riverine Forces comprise 2.4% (Figure 2) of the total NECC. The primary focus for Coastal Riverine Forces force is to establish and maintain control of rivers, harbors, ports, and coastal waterways. They are also capable of combating sea-based terrorism and various other illegal activities such as transporting components of weapons of mass destruction, hijacking, piracy, and human trafficking (NECC, 2014; NKO, 2014).

b. Naval Construction

Naval Construction personnel are also known as Seabees and constitute the majority of NECC forces with 49.8% (Figure 2) of personnel (NECC, 2014). They provide a wide range of construction support to forward operating forces such as roads, bridges, bunkers, airfields, and logistics bases. In addition, they provide responsive support to assist disaster recovery operations, perform civic actions, manage construction projects to improve relations with other nations, and provide anti-terrorism and force protection for personnel. Their motto is “We Build, We Fight” (NECC, 2014; NKO, 2014).

c. Explosive Ordnance Disposal

Explosive Ordnance Disposal (EOD) provides a wide range of services from disarming land and underwater explosive hazards to conducting counter improvised explosive device (IED) operations. EOD personnel comprise 8.6% (Figure 2) of the total NECC manning. EOD is capable of handling chemical, biological and radiological threats. EOD’s Mobile Diving and Salvage Units (MDSU) clear harbors of navigation hazards, engage in underwater search and recovery operations, and provide limited underwater repairs on ships (NECC, 2014; NKO, 2014).

d. Maritime Expeditionary Security Force

The Maritime Expeditionary Security Forces (MESF) is the second largest sub-command in the NECC at 22% (Figure 2) of the manning total. It is comprised of highly trained scalable and sustainable security units with the primary mission of defending

mission critical assets in near-coast environments. Expeditionary Security units provide worldwide maritime and in-shore surveillance, security, anti-terrorism force protection (ATFP), ground and afloat asset defense, and airfield/aircraft security. Additionally, MESF are capable of providing additional secondary tasks from detention operations to law enforcement (NECC, 2014; NKO, 2014).

e. Expeditionary Intelligence Command

Expeditionary Intelligence Command (NEIC) is capable of delivering rapid, flexible, relevant, and timely intelligence to expeditionary forces. This gives the forces freedom of movement within their area of operations. They are also capable of providing waterborne lines of communication to the supported forces which allows the forces to find, fix, and destroy the enemy and his assets within the area of operation. The NEIC is a small unit, i.e., 0.9% of the NECC (NECC, 2014; NKO, 2014).

f. Combat Camera

Combat Camera (COMCAM) generates video and still documentation of combat operations, contingencies, exercises, and naval events of historical significance. They are one of the smallest components of NECC at 0.3% (NKO, 2014).

g. Expeditionary Logistics

Expeditionary Logistics (NAVELSG) provide centralized worldwide expeditionary logistics support to all NECC expeditionary forces. NAVELSG is the third largest component of the NECC at 12.2% of total NECC manning. NAVELSG is responsible for conducting port and air cargo handling, customs inspections, contingency contracting, fuels procurement and distribution, freight terminal and warehouse operations, postal services, and ordnance reporting and handling (NKO, 2014).

h. Expeditionary Combat Readiness

Expeditionary Combat Readiness is responsible for coordinating and overseeing all administrative processes. This includes equipping, training, deployment, and re-deployment of sailors assigned as individual augmentees (IA). Additionally, they have

provisional units committed to Joint and Maritime Operations. They are the smallest component of NECC at 0.2% (NKO, 2014; NECC, 2014).

i. Maritime Civil Affairs and Security Training Command

Maritime Civil Affairs and Security Training Command (MCAST) works directly with civil authorities and civilian populations within a combatant commander's maritime area of operations. Their main objective is to lessen the impact of military operations on the civilian populace. The command also delivers timely, focused, and customizable training to host nations. It is versed in drawing training expertise from across the NECC force and DOD. They are another smaller component of NECC at 1.1% (NECC, 2014; NKO, 2014).

j. Guard Battalion

Guard Battalion (NEGB) is part of the Joint Task Force Guantanamo (JTF-GTMO) with the complete administrative oversight for NEGB-GTMO. The NEGB is 2.2% of the NECC. The NEGB is fully educated and trained in the procedures involving detainee operations such as cultural and legal issues, self-defense, first aid, use of non-lethal and lethal weapons, and qualification for external security (NECC, 2014; NKO, 2014).

B. NAVAL SPECIAL WARFARE COMMAND

The Naval Special Warfare Command (NSW) is the maritime component of U.S. Special Operation Command (USSOCOM). NSW is considered a tactical force with strategic impact (NKO, 2014). In addition to NSW, USSOCOM is comprised of four additional sub-commands: Joint Special Operations Command, Marine Special Operations Command, Air Force Special Operations Command, and Army Special Operations Command (see Figure 3). NSW forces are capable of operating independently or in conjunction with other U.S., allied, and coalition forces (NKO, 2014).

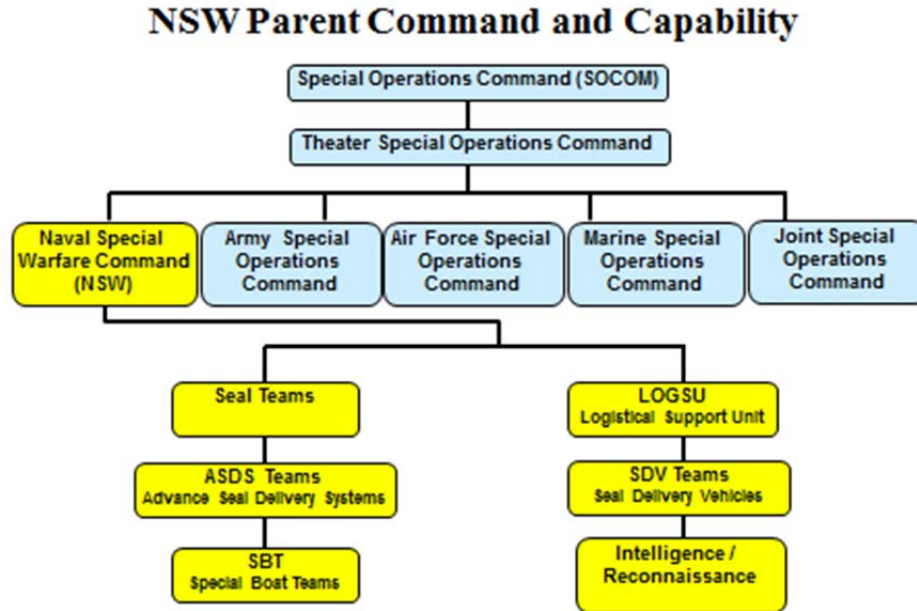


Figure 3. NSW Organization Structure (after NKO, 2014).

1. Naval Special Warfare Mission Areas

NSW has seven mission areas and the priorities of these missions are based on the risk to our national security. These mission areas are (USSOCOM, 2012):

- 1) Combating terrorism is comprised of antiterrorism (defensive actions) and counterterrorism (offensive actions).
- 2) Counter-proliferation of weapons of mass destruction (WMD) is composed of the actions taken to seize, destroy, capture, or recover WMD.
- 3) Direct action which is comprised of short strikes, raids and ambushes, standoff attacks, recovery operations, precision destruction, anti-surface warfare, and amphibious warfare.
- 4) Special reconnaissance is comprised of environmental reconnaissance, armed reconnaissance, coastal patrol and interdiction, target and threat assessment, and post-strike reconnaissance.
- 5) Unconventional warfare is a broad spectrum of military and paramilitary operations predominantly conducted by indigenous forces such as guerrilla warfare, covert or clandestine operations, subversion, sabotage, and support of evasion and escapes.

- 6) Physiological/information warfare induces or reinforces foreign civil or military attitudes and behaviors favorable to our objectives.
- 7) Foreign Internal Defense is the organization, training, advising, and assisting of host nation (HN) military and paramilitary forces to maintain internal stability. (p. 8)



Figure 4. NSW Mission Range (from NKO, 2014).

2. Naval Special Warfare Squadron Structure

NSW is SEAL Teams and SEAL Team support-centric and deploys as an NSW squadron (NSWRON). NSWRON is commanded by a Navy SEAL Commander (O-5), and it is comprised of SEAL platoons and attachments from NSW Headquarter, EOD, Special Boat Teams, Tactical, Medical, logistical support, and other support units. NSWRON size is approximately 250 personnel.

Platoon size is approximately 14–21 people per platoon. Based on a mission, platoons can be structured to operate as 8-man Squads, 4-man Fire Teams, or 2-man Sniper/Reconnaissance Teams. It is this organizational structure (see Figure 5) that makes the NSW force light, mobile, flexible, and effective (NWP 3.05.41, 2010).

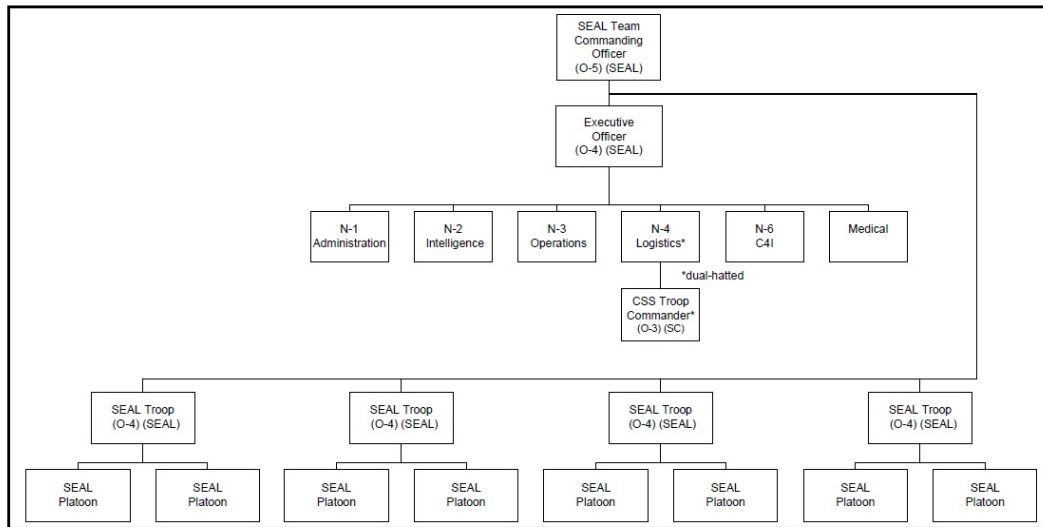


Figure 5. NSW Squadron Structure (from NWP 3.05.41, 2010).

Based on the theater or mission requirements, NSWRON generally deploys with additional resources from outside the Teams:

- Additional CSS personnel (from LOGSU, IA, and/or Reserves): 15–40 personnel
- Communications Troop (sourced from Mobile Comms Team): 20–24 personnel
- Military Working Dog (MWD) and Handler (SA-1/SA-2): 2 handlers per team
- UAV Detachment (SA-1/SA-2): varies
- RIB Detachment (from SBT): 12 personnel for every 2 RIBs
- EOD (from EODMU): 4–8 EOD techs
- Intel Support Augments (various sources): 2–5 personnel
- Mobile Field Surgical Team (MFST) and/or Critical Care Evacuation Team (CCET): approximately 12 people

Not all NSWRON will have all of the above nor would they necessarily be in all locations. For example, a platoon deploying to Guam may be accompanied by a RIB Detachment, but another platoon from the same team deploying to Afghanistan at the same time would obviously not need RIBs. At any given time, each NSWRON is in one of the four phases of a two-year cycle and each phase is six months (Figure 6).

24 MONTH DEPLOYMENT CYCLE - TRAINING (IDTC) & DEPLOYMENT																							
PRODEV						ULT						SIT						DEPLOY					
Professional Development Individual Training						Unit Level Training						Squadron Interoperability Training						Deployment					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
SEAL Team																							
						NSW Squadron																	
						Task Group																	
						NSW SEAL Troops																	
						Task Units																	
						NSW CSS Troop																	
						CSS Detachments																	
						NSW SEAL Platoon/Detachment																	
						Task Element																	

Figure 6. NSWRON Deployment Cycle (from NWP 3.05.41, 2010).

Phase one of the cycle is called the professional development (PRODEV). During this phase, NSWRON personnel receive individual training to build their core competence. During phase two—the unit level training (ULT)—NSWRON train and learn how to work as individual units or as a team. Phase three squadron interoperability training (SIT) is probably the most critical phase of the cycle. During this phase, individual teams/units are integrated into an NSWRON and learn to work together in a squadron as a whole. Finally, in the phase four deployment (DEPLOY), NSWRON deploy and they are under control of one of the seven theater special operations commands (see Figure 7).



Figure 7. Theater Special Operations Commands (from NKO, 2014).

3. Theater Special Operations Commands

Theater Special Operations Commands (TSOC) are considered to be geographic experts for all special operations in their theater. They report to their geographic combatant commander and are responsible for planning, preparation, and command and control of Special Operation Forces (SOF) from the Army, Navy, Marines, and Air Force (USSOCOM, 2012).

a. *Special Operations Command Central*

Special Operations Command Central (SOCCENT) is headquartered at MacDill Air Force Base in Tampa, Florida. It is a sub-unified command of the U.S. Central Command (USCENTCOM). SOCCENT's primary task is planning special operations throughout the USCENTCOM area of responsibility (AOR). Its other tasks are planning and conducting peacetime joint/combined special operations training exercises and orchestrating command and control (C2) of peacetime and wartime special operations. SOCCENT is heavily dependent upon reserve Individual Mobilization Augmentees (IMAs) for its daily operations and conduct exercises as directed (Pike, 2013).

b. Joint Forces Command

Joint Forces Command (SOCJFCOM), located in Norfolk, Virginia, is a sub-unified command of USJFCOM. SOCJFCOM's primary task is to train conventional joint forces and SOF commanders and staffs (combatant commanders and joint task force staffs). Its other tasks include collecting and reporting operational insights and lessons learned and providing SOF subject matter experts support to joint integration and experimentation efforts (Pike, 2013).

c. Special Operations Command Pacific

Special Operations Command Pacific (SOCPAC), located at Camp H. M. Smith, Oahu, Hawaii, is a sub-unified command and special operations forces component command for the U.S. Pacific Command (PACOM). SOCPAC's primary task is to plan and direct special operations and related activities in the Pacific Theater. It represents the largest geographic area of the unified commands (Pike, 2013).

d. Special Operations Command, South

Special Operations Command, South (SOCSOUTH), located at Homestead AFB, Florida, is a sub-unified command for special operations. SOCSOUTH's primary task is to support the USSOUTHCOM Strategy of Cooperative Regional Peacetime Engagement. They provide SOF capabilities to assist shaping theater's security environment and to provide appropriate force posture response when U.S. interests are threatened. Their AOR includes the land and surrounding waters of Latin America (south of Mexico), the Caribbean Sea, and the Gulf of Mexico (Pike, 2013).

e. Special Operations Command, Europe

Special Operations Command, Europe (SOCEUR), located in Stuttgart, Germany, is a sub-unified command of U.S. European Command (EUCOM). SOCEUR's primary task is to provide operational direction and control of special operations, civil affairs, and psychological operations forces in the EUCOM area. It is responsible for supporting U.S./NATO partnership activities and execution of counterterrorism, peacetime, and contingency operations (Pike, 2013).

f. Special Operations Command, Africa

Special Operations Command, Africa (SOCAFRICA), located in Stuttgart, Germany, is a sub-unified special operations command for Africa. SOCAFRICA's primary task is to support AFRICOM's mission with the full spectrum of Special Operations Forces capabilities. This includes civil affairs, information operations, theater security cooperation, crisis response, and campaign planning (Pike, 2013).

g. Special Operations Command, Korea

Special Operations Command Korea (SOCKOR), located at Camp Kim in Yongsan, Korea, is responsible for supporting U.S. Forces Korea/United Nations Command/Combined Forces Command for special operations forces on the Korean peninsula. SOCKOR's primary task is war planning. Its other tasks are targeting, training, and participating in exercises and contingency operations on the Korean peninsula (Pike, 2013).

4. Explosive Ordnance Disposal Group Capability

Navy EOD units are very unique in the sense that they are the only military force capable of both parachuting in from the air and diving under the sea to disarm weapons. There are a total of two EOD organizational groups (EODGRU): EODGRU ONE is located in San Diego, California (Naval Amphibious Base, Coronado); EODGRU TWO is located in Virginia Beach, Virginia (Joint Expeditionary Base, Little Creek). Each group is comprised of five units (Figure 8): Mobile Units (EODMU), Mobile Dive and Salvage Units (MDS), Training and Evaluation Units (EODTEU), Operational Support Unit, and Expeditionary Support Units (ESU) (NKO, 2014; EOD, 2012).

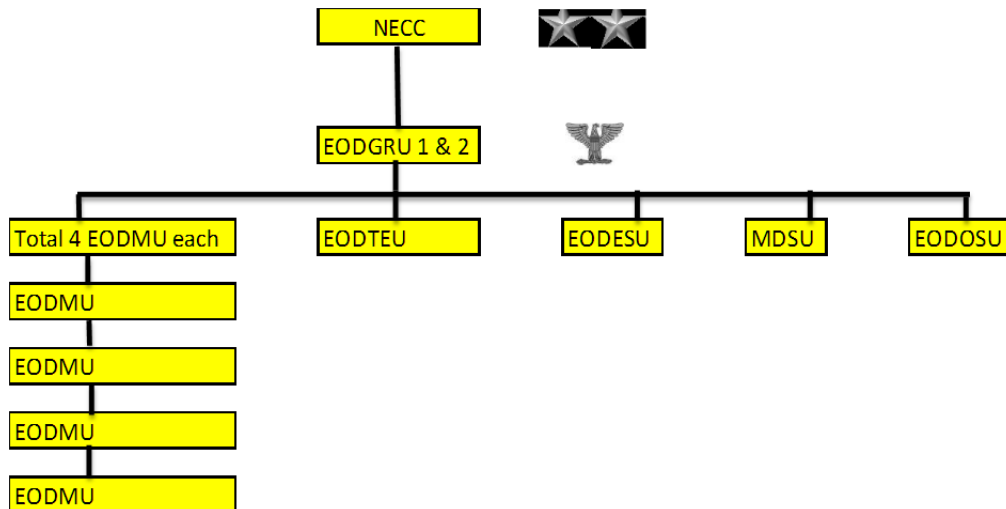


Figure 8. EDO Group Structure (from EODESU1, 2014).

a. Mobile Units

Mobile Units (EODMU) provide deployable command and control (C2) combat units for electronic ordnance disposal, counter-IED (Improvised Explosive Device), and diving and salvage operations to joint, naval, and combined task force commanders. Each mobile unit is capable of deploying independently or as an imbedded force with other services or commands (NKO, 2014; EOD, 2012).

b. Training and Evaluation Units

Training and Evaluation Units (EODTEU) are specialized training units that provide advanced unit level and mobility skill training for deploying forces. They specialize in four types of skill sets: Core EOD, Navy Diver Salvage, Core Mobility, and Expeditionary Skills (NKO, 2014; EOD, 2012).

c. Operational Support Unit

Operational support units are the reservists that perform the same functions as mobile units and serve to reduce the operational stress on active duty troops (NKO, 2014; EOD, 2012).

d. Mobile Dive and Salvage Units

Mobile Dive and Salvage Units (MDS) are special dive teams capable of conducting under water harbor clearance, diving and salvage, and limited battle damage repair. They also are equipped with and maintain a variety of underwater equipment such as scuba gear, towed sonar devices, and unmanned under-water vehicles that they use to perform search operations in different bodies of water (NKO, 2014; EOD, 2012).

e. Expeditionary Support Units

Expeditionary Support Units (ESU) support all of the logistical and financial management needs associated with all EOD units. ESU's mission is to provide financial, logistic, and material maintenance management for all EODGRU forces (NKO, 2014; EOD, 2012).

5. Naval Special Warfare Group Capabilities

Navy Special Warfare command is responsible for training, equipping, and deploying components of NSW Squadrons throughout the world. NSW is comprised of six NSW Groups (NSWG) located between Coronado, California, and Little creek, Virginia. The NSW organization is SEAL-centric and each group is designed with SEAL team support in mind. Aside from SEAL teams, groups are comprised of Special Boat Teams, Logistical Support Units, and SEAL Delivery Vehicle Teams (see Figure 9 and the following descriptions).

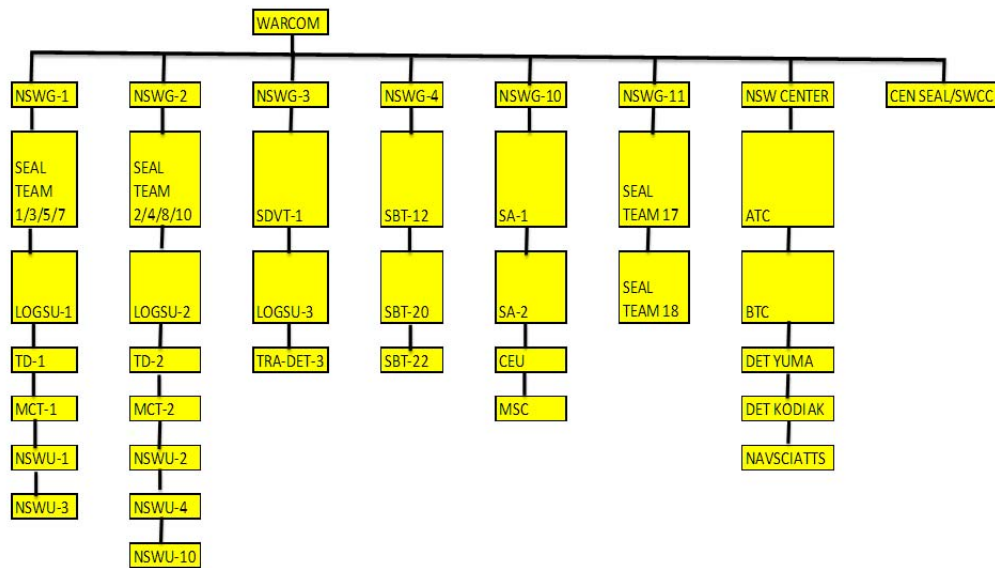


Figure 9. NSW Command Structure (from LOGSU1, 2014).

a. SEAL Teams

SEAL stands for Sea, Air, and Land. They are NSW's Special Operations Force and they engage in combat operations. NSW has ten navy SEAL teams (see Figure 5). The odd-numbered Teams (1, 3, 5, 7, and 17) are located in Coronado, California. The even-numbered teams (2, 4, 8, 10, and 18) are located in Little Creek, Virginia (NKO, 2014; USSOCOM, 2012).

b. Special Boat Teams

The primary mission of the Special Boat Teams (SBT) is to support special operations missions on the rivers and coasts using specialized high performance, low profile combat crafts. They are capable of stealthy insertion and extraction of SEALs, covert reconnaissance, and combat gunfire support (NKO, 2014; USSOCOM, 2012).

c. Logistical Support Unit

Logistics Support Units (LOGSU) are regionally located on both coasts and are capable of providing full logistics support to their respective NSW groups (NSWG). They provide logistics support in the following functional areas: supply, contracting,

service, combat systems, facilities management, combat service support, medical, communications, and transportation (NKO, 2014; USSOCOM, 2012).

d. SEAL Delivery Vehicle Teams

The primary mission of the SEAL Delivery Vehicle Teams (SDVT) is to provide long range under water stealthy delivery systems to SEAL teams. They deploy with the SEAL teams on specially modified submarines capable of supporting SEAL Delivery Vehicles (SDV), Dry Deck Shelters (DDS), and the Advanced SEAL Delivery System (ASDS). SDV are small wet submersible vehicles where the swimmers are exposed to water. Their sole purpose is to increase the speed and range for the swimmers. DDS are the removable modules that attach to the submarine that allow the divers to enter or exit submarines while submerged. ASDS are the mini submarines capable of carrying up to 16 SEALs (NKO, 2014; USSOCOM, 2012).

III. EXPEDITIONARY LOGISTICS

A. DEFINITION

Joint publication 4.0 defines logistics as “planning and executing the movement and support of forces” (Joint Chiefs of Staff, 2013). Expeditionary logistics, or EXLOG, falls on the line between the operational and tactical levels (see Figure. 9) (NKO, 2014). There are several definitions for expeditionary logistics available in various military instructions and publications. NECC adopted the expeditionary logistics definition as stated in Navy Tactical Reference publication 1-02, which defines expeditionary logistics as:

The science of planning and carrying out the movement and maintenance of an armed force organized to accomplish a specific objective in a foreign country. In its most comprehensive sense, those aspects of military operation that deal with design and development, acquisition storage, movement, distribution, maintenance, evacuation, and disposition of materiel; movement, evacuation, and hospitalization of personnel; acquisition or construction, maintenance, operation, and disposition of facilities; and acquisition or furnishing of services (DON NTRP 1-02, 2012, p. 2-32).

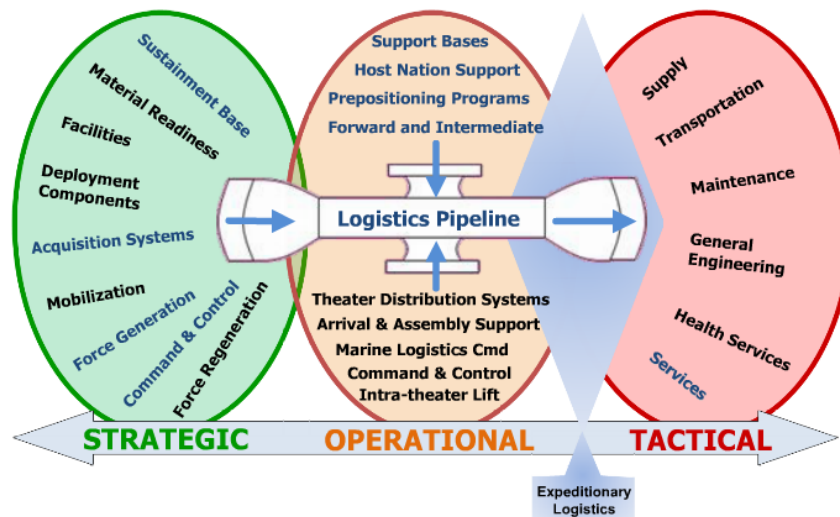


Figure 10. Levels of Logistics (from NKO, 2014).

The levels of logistics correspond directly to the three levels of war: Strategic, Operational, and Tactical (see Figure 10). Strategic logistics focuses on organizing, training, and equipping the SOF forces. Whereas, operational logistics provides the link between tactical requirements to strategic capability in order to accomplish operational goal. They provide theater-wide logistical support, closely monitor in-theater shortfalls, communicate shortfalls to strategic sources, and continuously match tactical requirements with strategic recourses. Finally, tactical logistics primarily focuses on providing key services to support battles and engagements (NKO, 2014; DON NTRP 1-02, 2012).

Two primary key areas of focus for EXLOG are Sustainment and Combat Service Support. Sustainment provides forces the necessary equipment and services to maintain and/or prolong operations until successful mission completion. Effective sustainment allows combat commanders and expeditionary forces to have depth to seize, retain, exploit, and conduct decisive operations. Combat Service Support allows forward operating forces to have necessary supplies, equipment, transportation needs, and various services to support elements in theater at all levels of war.

Expeditionary logistics is often challenged with the “tyranny of distance” (NKO, 2014). They often operate in areas far from Navy supply and distribution chains. Expeditionary logisticians often rely on host nations for support. They heavily rely on local contracts, vendor support, and commercially available supplies.

1. Functional Areas

EXLOG is comprised of six functional areas (NKO, 2014): Supply, Maintenance, Transportation, General Engineering, Medical, and Other Service (food, disbursing, postal, MWR, etc.). The main three components of logistics are Supply, Maintenance, and Transportation.

a. Supply

Supply functions as a materiel and financial management support that is similar to Supply Department afloat. The functions include ordering, procurement, receipt, stowage, and inventory control of repairable and consumables items.

b. Maintenance

Maintenance functions as a team responsible for developing and performing all maintenance policies and procedures. In addition, they are also responsible for all equipment maintenance that preserves, repairs, and maintains reliability.

c. Transportation

Transportation takes care of movement of personnel and materiel from one point to another. They are well versed in worldwide ports of embarkation, debarkation, inter-theater, and intra-theater locations.

d. Engineering

Expeditionary engineering is primarily a function of the Naval Construction Force, commonly referred to as “Seabees.” Individual Seabees can be deployed independently or can be imbedded into other expeditionary units. Seabees are capable of a wide range of construction services such as combat engineering, rapid runway repair, facility damage repair, combat engineering, bridge and road construction, and maintain facilities ashore. In addition, they also provide responsive support disaster recovery operations and perform civic action construction projects to improve relations with other nations.

e. Health Services

Health services include all medical, dental, and all health-related functions (combat and non-combat) to include; health maintenance, entomology, medical readiness of personnel, food service sanitation, treatment of casualties, and medical evacuation.

f. Other Logistic Services

They function as a general area that includes services such as food, post, disbursing, exchange, billeting, legal, barber, laundry, and other administrative services and functions.

B. EXPEDITIONARY SUPPLY AND LOGISTICS SUPPORT PROCESS

NECC and NSW expeditionary forces both have their own logistical support units that specialize in understanding and supporting the unique needs of their forces. Expeditionary logistics straddles the line between the operational and tactical levels of logistics as shown in Figure 9.

1. Expeditionary Supply Support

Expeditionary logisticians deploy with the expeditionary forces to forward operating areas to establish supply and logistical hubs as close as possible to the areas of operations. NECC and NSW supply and logistical support units are capable of providing financial and budget management, contracting support, warehouse management, hazardous material (HAZMAT) management, transportation, ammunition management, and various other support functions.

NECC and NSW supply and logistical support units manage three categories of gear: Individual, Team Specific, and Programmatic. These categories are comprised of various combinations of three sub-categories: Personal Gear Issue (PGI), Table of Allowance (TOA), and Major Force Program (MFP-11, Special Operations Forces) gear and equipment (NSW only) (NKO, 2014). The gear is issued as an individual issue or a team issue. Team issue gear is mainly comprised of TOA commodities. Along with some of the individual issue gear, all TOA gear must be either returned back to supply support upon return from deployment or turned over to the incoming team in theater using Remain-In-Place/TOA (RIP/TOA) processes (NKO, 2014; EODESU1, 2014; LOGSU1, 2014).

a. PGI

PGI refers to organizational clothing and equipment issued to an individual while checking into expeditionary command. When standard uniform items are deemed inadequate, PGI gear is specifically designed to provide personal protection during training, combat, and in hostile environments. Examples of gear are: Uniforms, Cold weather gear, Wet or Dry suits, etc. (NKO, 2014).

b. TOA

TOA is the listing of approved equipment and materiel required by NECC and NSW units to perform their missions in contingency, wartime, and disaster recovery operations. TOA is supported by three documents: Required Operational Capability (ROC), Projected Operational Environment (POE), and Navy Mission Essential Task List (NMETL). TOA listing varies based on a unit's primary capabilities and mission statement. TOA is designed to support all unit requirements for 60 days with the exception of food and fuel—supported for 15 days. TOA does not support ammunitions. Examples of these are: Weapons, Specialty tools and Equipment, Body armor, etc. (NKO, 2014).

c. MFP-11 Gear and Equipment

USTEDA is an authorization document for MFP-11 gear and equipment. MFP-11 gear is specifically for NSW forces. It includes mission-specific items not part of PGI or TOA. Rather, they are needed by Special Operations Forces (SPEC OPS) to complete its mission. Equipment includes: Unmanned Aerial Reconnaissance Vehicles, SPEC OPS-specific weapons, etc. (NKO, 2014).

2. Funding and Requisition Process

Even though NCC and NSW are both part of the Navy, their funding comes from different sources. NECC relies solely on the funding from Department of Navy (DON) and is provided through USFFC; whereas, NSW funding is provided by Joint Special Operations Forces Command and through WARCOM.

The expeditionary requisitions processes are unique when compared to standard fleet requisition process. Over 95% of the fleet requisitions are filled through the navy supply system using National Stock Number (NSN). Less than 5% are open purchases. Whereas in expeditionary logistics, approximately 70% of the requisitions are open purchases and only 30% are NSN requisitions (NKO, 2014). The expeditionary environment and mission add unique variables such as distinctive operating environment, staying current with technology, and greater need for speed. Because of its availability,

these situations force expeditionary units to heavily rely upon open purchases for commercial off-the-shelf or local procurement products. NECC and NSW use several IT systems (EODESU1, 2014; LOGSU1, 2014), including methods of procurement and inventory management. They also use other systems and processes such as NTCSS R-Supply, WASP, Special Warfare Automated Logistics Information System (SWALIS), Special Operations Forces Personal Equipment Advanced Requirements System (SPEARS), Readiness and Cost Reporting Program (RCRP), Mobility Inventory Control Accountability System (MICAS), garrison reach-back, Government Commercial Purchase Card (GCPC), Field Ordering Officer and Paying Agent (FOO/PA), and Contracting Support (NKO, 2014).

(1) **R-Supply**: computer-based system used by both EOD and NSW. It serves as their primary system to manage maintenance, supplies, NSN requisitions, budgeting, and financial reporting.

(2) **WASP**: stand-alone commercial off-the-shelf inventory management software that is used as the primary inventory management system (EODESU). The system was implemented in 2010 and serves as EODESU's primary inventory and warehouse management system. WASP is not part of the navy program of record, and it is a non-networked local system that does not allow asset visibility outside the command. It does come with capabilities. These include a barcode scanner, barcode labeling software, and basic inventory asset tracking that allows EODESU to manage its inventory much more efficiently. Prior to WASP, the primary method used to manage inventory was MS Excel spreadsheets (EODESU1, 2014).

(3) **SWALIS**: developed and fielded for U.S. Special Operations Command (USSOCOM) to provide Total Asset Visibility (TAV) across the NSW enterprise. LOGSU uses this system to primarily manage PGI and TOA gear for NSW forces. SWALIS is DODAF-compliant and WLAN-capable. It allows NSW forces to have real-time visibility on load-out status and locations of all mission-critical equipment (LOGSU1, 2014).

(4) **SPEAR**: system used by NSW LOGSUs to manage body armor systems, protective eyewear, and Protective Combat Uniform (PCU) (LOGSU1, 2014).

(5) **MICAS**: automated system used by LOGSU to track shelf-life and inventory of Chemical Biological and Radiological (CBR) individual protective Equipment for NSW forces. It provides centralized management of CBR assets. This also means centralized reporting capability, increased data accuracies, and improved efficiencies in asset visibility and shelf-life management (LOGSU1, 2014).

(6) **Garrison reach-back**: when deployed units are unable to obtain materiel or equipment locally, they then communicate their needs to the stateside support unit (NKO, 2014).

(7) **GCPC**: based on established spending limits, this allows authorized personnel to make micro-purchases to support one's expeditionary units (NKO, 2014).

(8) **FOO/PA**: FOO is an individual authorized in writing by the contracting officer to execute purchases using Standard Form (SF) 44. PA is an individual appointed in writing to pay for FOO authorized purchases with cash and other negotiable instruments (NKO, 2014).

C. NSW AND EOD LOGISTICAL SUPPORT UNITS

Logistical Support Units serve as centralized supply, logistics, and support functions for their command. They are capable of providing a wide range of services essential for successful accomplishment of the mission. EOD is supported through Expeditionary Support Units (ESU), whereas, NSW is supported through Logistical Support Units (LOGSU).

1. EOD Logistical Support Unit

EOD Logistical Support Unit (EODESU) command structure is broken down into seven departments with specific function—also referred to as command commodities. The command commodities include: administrative, operations, civil engineering support equipment (CESE), supply, craft, material, and medical. This study's focus will primarily

look into the Supply and Material Department functions such as managing inventory processing requirements and managing budgets for all units supported by the ESU.

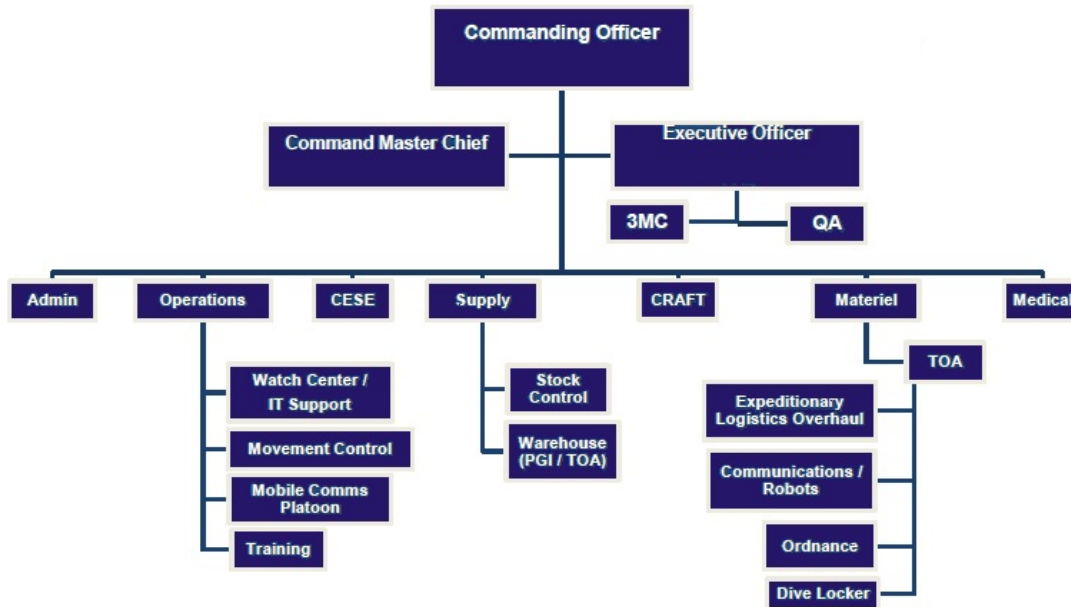


Figure 11. EODESU Command Structure (from EODESU 1, 2014).

The majority of the inventory materials are managed between the Supply and Material commodities (Figure 11). Each department maintains separate warehouses. Supply manages PGI gear, whereas the materiel department manages the TOA gear. Both use WASP as their primary inventory management system (EODESU1, 2014).

a. EOD Supply

Supply functions are similar to the Stock Control (S-1) division ships. Supply is responsible for budgeting, inventories requisitioning, and financial reporting. Supply uses R-Supply to manage its financial and requisition data; it uses WASP to manage warehouse and inventories. They use various procurement methods such as NSN requisitions through the navy supply system and open purchases using the government credit card (GPCP). GPCPs have a single purchase threshold set at \$3k. Any purchases over that limit require contracting support from Fleet Logistical Centers (FLC) contracting department. Once the material is received at ESU, it is manually inputted and

recorded in the WASP. Once material is entered, all tracking, issuing, and inventorying are maintained through WASP.

Supply is also responsible for ensuring all the EOD techs are equipped with PGI gear; Material folks are equipped with TOA gear to track and replace missing and lost gear (PGI/TOA). EOD's primary source for acquiring all PGI gear is the NECC's Central Issuing Facility (CIF). The CIF provides central management by using a web-based automated system that keeps track of gear requisitions. There are two CIF locations: one is located in Port Hueneme, California, and the other is located in Virginia Beach, Virginia (EODESU1, 2014).

b. EOD Materiels

The Materiels warehouse is used primarily for TOA gear and controlled by non-supply rated EOD techs. EOD techs receive on-the-job inventory management training. The Material department receives the authorized TOA listing from Readiness and Cost Reporting Program (RCRP) and through end user feedback and is required to maintain an adequate inventory to maintain readiness.

RCRP provides capabilities to satisfy the readiness and logistics needs of Navy Expeditionary Combat Command (NECC) operating forces. RCRP is a readiness reporting system, which provides NECC forces with a standardized, enterprise-wide capacity to measure, display, and report the readiness status of Personnel, Equipment, Supply, Training and Ordnance.

Materiels personnel are responsible for issuing from and returning of the TOA gear after use back to their warehouse. They also responsible for logistical overhaul of the TOA gear. This basically means they are capable of repairing, reconditioning, and replacing any and all TOA gear once it is return back to them (EODESU1, 2014).

2. NSW Logistical Support Units

There are a total of three Logistics Support Units: LOGSU ONE and THREE, both located at Naval Amphibious Base Coronado, California; and LOGSU TWO located at Naval Amphibious Base Little Creek, Virginia. LOGSU is structured as an Echelon IV

command and is commanded by an O-5 Supply Corps Officer. They are further subdivided into six departments and are responsible for providing Combat Service Support Troops (CSST) to deploying NSWRON.

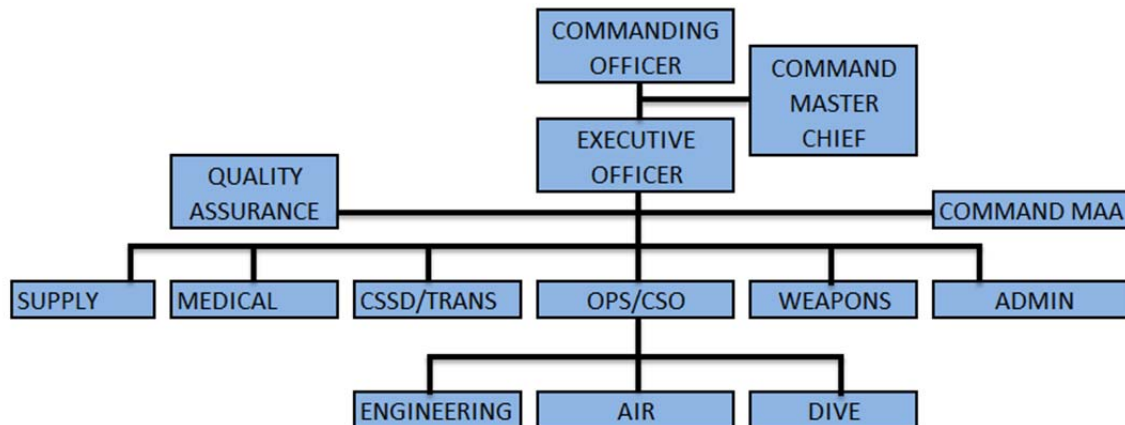


Figure 12. LOGSU Command Structure (from LOGSU1, 2014).

CSST provides coordination between appropriate component commands and offices to provide support to forward-deployed NSW forces. This allows NSW forces to have contingency contracting capability and expertise in making small purchases in theater.

a. NSW Supply

Similar to EOD supply, NSW supply functions are similar. NSW's primary functions are budgeting, inventory requisitioning, and financial reporting. They use R-Supply to manage its financial and requisition data. They also manage warehouse and inventory with several IT systems: SWALIS for PGI and TOA; SPEARS for body armor; and MICAS for CBR gear. These systems are not compatible with each other and require manual entries once the material is received at the supply warehouse. Their procurement methods are similar to EOD, but NSW does have its own dedicated contracting department for non-NSN purchases above \$3k (LOGSU1, 2014).

IV. CASE STUDY

Background

As America concludes the war in Iraq and continues its efforts to withdraw from Afghanistan, our National Defense Strategy has been necessarily tempered by the recognition of the enormous expenses incurred in these wars. While our efforts in these conflicts demonstrated the potency of America's military capability, the expenses they incurred, and the debt burden they placed on the nation's budget highlighted the increasing vulnerability of our finances. The nation will face threats from both traditional state actors and nontraditional actors such as terrorist organizations and it must be prepared to meet them. In all cases, however, the nation's plans must consider the prudent use of financial resources and prioritize them more effectively than at almost any time in recent history. This change in perspective is reflected in the recent 2014 Quadrennial Defense Review that includes a lengthy discussion of the impact of the Budget Control Act (BCA) of 2011 as well as the possible effects that sequester-level cuts could have on the Navy. It is clear from this discussion that the financial pressure on the Navy is growing and the need to find and implement cost saving measures is critical to our service's continued success.

U.S. Navy Expeditionary Forces are comprised of two separate commands: Navy Expeditionary Combat Command (NECC) and Naval Special Warfare Command (NSW). Through the Authorization Act of 1987, NSW was commissioned as the maritime component of the U.S. Special Operations Command (USSOCOM). Then in 2006, NECC was established under U.S. Fleet Forces Command (USFFC). The key reason for this separation lies in the nature of the missions with which each command is assigned. The primary mission of NECC is to provide combat ready units for expeditionary missions to the Joint Coalition Force Maritime Component Commands (JFMCC) and Navy Unified Combatant Commands (COCOM). This is in contrast to NSW, which is a tactical force that conducts missions with strategic impact to alleviate the risks to our national security.

Expeditionary combat forces perform a mission that is unlike that of the traditional Navy. Further, the logistics that support them is different as well and requires particular study to understand and appreciate the challenges inherent to the mission. The following are two case studies. Each examines the typical logistics operations required to support NSW squadron and EOD mobile units as they each progress through their respective fleet readiness training program (FRTTP) cycles from the BEGINNING PHASE to their return from deployment. It should be made clear at the outset that although the case studies are hypothetical, they are highly realistic. The case study methodology will clearly illustrate the business practices currently in place. It will also provide opportunity for conducting a critical analysis of these procedures and generating recommendations for improvement and further inquiry. The goal of these case studies is to contribute to the improvement of the financial performance of these organizations to enhance their combat effectiveness.

A. NAVAL SPECIAL WARFARE LOGISTICS STUDY

We visited Logistical Support Unit ONE (LOGSU 1) in Coronado, California, to better understand their logistical process as part of this study's research. While visiting, it was discovered that they were facing approximately 70% loss in accountability (Exhibit 1) in their issued gear as the NSW squadrons returned from deployment. In light of current fiscal constraints and budget cuts, it is imperative that NSW forces maintain readiness. If these losses continue, they will have significant impact on readiness. The goal in this case study is to describe the current NSW processes for both gear management and issue and return. Another goal is to identify areas of improvement for further research.

Background

Naval Special Warfare Squadron X (NSWRON X) based out of Naval Amphibious Base, Coronado, California, has returned from their six-month deployment. During this deployment, they were under the control of Theater Special Operations Command, Africa (SOCAFRICA) (Exhibit 2). In addition to the equipment already pre-

staged in theater, they had deployed with a significant amount of gear and equipment—approximately 30-40 Individual Storage Units (ISU). The equipment already in theater is considered Relief in Place/Transfer of Authority (RIP/TOA) gear that goes through a custody turnover between the outgoing and incoming squadrons. Examples of typical RIP/TOA gear would be vehicles, boats, UAV's and their systems, generators, and similar items. Upon return from deployment, the gear that NSWRON took with them is required to be returned to Logistical Support Unit One (LOGSU ONE) for reconditioning, repairs, replacement, and reissue.

NSW organization is SEAL-centric; thus, each group is designed with SEAL team support in mind. NSW is comprised of six NSW Groups (NSWG) located between Coronado, California, and Little Creek, Virginia. Aside from the SEAL teams, groups are comprised of five sub-commands: Advanced SEAL Delivery System Team, Special Boat Teams, Logistical Support Units, SEAL Delivery Teams, and Intelligence/Reconnaissance Teams (Exhibit 3). NSW forces are capable of operating independently or in conjunction with other U.S. allied and coalition forces.

NSW has seven mission areas which are prioritized based upon the risk to the nation's national security. These mission areas are: combating terrorism, counter-proliferation of weapons of mass destruction (WMD), direct action, special reconnaissance, unconventional warfare, physiological/information warfare, and foreign internal defense (Exhibit 4).

NSW forces deploy as a squadron (NSWRON). NSWRON is commanded by a Navy SEAL Commander (O-5) and it is comprised of SEAL platoons and attachments from NSW Headquarters, EOD, Special Boat Teams, Tactical, Medical, logistical support, and other support units. NSWRON size is approximately 250 personnel (Exhibit 7). At any given time, each NSWRON is in one of the four phases of a two-year training/deployment cycle determined by USSOCOM. Each of the following phases is six-months long (Exhibit 5):

- Phase one: Professional Development (PRODEV). During this phase, NSWRON personnel receive individual training to build and refine their core competencies.

- Phase two: Unit Level Training (ULT). During this phase, individuals learn how to work as a unit or a team.
- Phase three: Squadron Interoperability Training (SIT). This is probably the most critical phase of the cycle. During this phase, individual teams/units are integrated into a NSWRON and they learn to work together in a squadron as a whole.
- Phase four: Deployment (DEPLOY). During this phase, NSWRON deploys and is under the control of one of the seven theaters' special operations commands.

Once NSWRON enters into the first phase of their training cycle, the Logistical Support Unit (LOGSU) initiates the gear issue process. It is imperative that NSWRON train with the same gear that is going to be used during its deployment. This allows gear proficiency and the ability to identify any unforeseen gear issues prior to deployment.

Logistical Support Units

LOGSU is comprised of six departments: supply, medical, transportation, operations, weapons, and administration (Exhibit 10). Each department is responsible for maintaining and equipping NSW forces with the specific items needed for deployment. LOGSU's manage three categories of gear issued to NSW forces: Individual, Team Specific, and Programmatic. These three categories are comprised of combinations of three sub-categories: Personal Gear Issue (PGI), Table of Allowance (TOA), and Major Force Program 11 (MFP-11) gear and equipment (Exhibit 8). Additionally, LOGSU is responsible for providing Combat Service Support Troops (CSST) personnel to deploying squadrons.

Gear Issue Process

LOGSU uses several IT systems to manage its gear. R-Supply is the primary system for financials, budgeting, and NSN item procurement and management. SWALIS is the primary warehouse inventory management system. In addition to SWALIS, SPEARS is used for body armor management, and MICAS is used for Chemical Biological Radiological (CBR) gear management.

Starting at phase one of the deployment cycle, NSWRON personnel and teams are responsible for identifying, requesting, and picking up the needed gear at LOGSU. For example, they go to supply for PGI and some TOA items; Weapons department for weapons; operations for parachutes or dive gear; and on (Exhibit 10). These departments are not centrally located, and they maintain their own warehouses. They issue the items using SWALIS and manually generate DD Form 1149 (Requisition and Invoice/Shipping form). There is a full listing in R-Supply for custody turnover. This process requires double entries because the R-Supply and SWALIS databases are not compatible with each other. LOGSU ONE coined this process as “Swivel Chair” inventory management. This is because it literally requires chair swiveling between the two systems while issuing, receiving, or returning gear. Once the gear is issued, the DD Form 1149 becomes the primary source of gear inventory management for the NSW teams. If there are any items needed that are not in the warehouse inventory, the appropriate departments submit purchase requests to Supply for procurement.

Procurement Process

The Supply department serves as a centralized location for all procurements for the NSW group. Supply primarily uses two methods for procurement. It receives the procurement requests submitted by other departments. Then based on the cost or type of items, the appropriate procurement process is initiated. Supply uses standard NSN requisitions through the Navy supply system and open-purchases through commercial sources. A government credit card (GCPC) is used for single purchases under \$3k, and any purchases over \$3k are completed using already in place IDIQ contracts, GSA sources, or NSW contracting support for any new contracts.

The expeditionary requisitions processes are unique when compared to standard fleet requisition process. Over 95% of fleet requisitions are filled through the Navy supply system using National Stock Number (NSN). Less than 5% are open-purchases. In comparison, approximately 70% of the requisitions in expeditionary logistics are open-purchases, and only 30% are NSN requisitions (NKO, 2014).

The NSN requisition process is quite simple. Logistical specialists (LS) use R-supply to generate a requisition, and then they electronically release it to the Navy supply system for fulfillment. Obligated funds are then automatically subtracted from the command's total budget. Once the requisitions are received at their warehouse, R-supply automatically assigns a location either for stocking in the warehouse or issuing to the respective department. If the item requested is a non-NSN item, the open-purchase through commercial sources procurement method is used.

To initiate open-purchase, LSs obligate funds in R-Supply to the GCPC line of accounting or the contract line of accounting. Then the commercial source is paid using a GCPC. Without first obligating money in R-supply, there is no authorization to pay the source. Once the product is received from the vendor, the transaction total is confirmed in R-supply. Then LSs manually record each item in SWALIS to either stock the item(s) in the warehouse or get each ready for issuing.

During the Training Cycle

As NSWRON goes through the training cycle, they use the same gear they will bring on deployment or on assignment to via the RIP/TOA process. During the training cycle, if gear gets damaged, lost, or consumed, a designated team member goes to LOGSU for a replacement item. Consumable gear/items are replenished, and damaged/lost items are replaced through either the one-for one turn-in process or survey process using DD form 200.

- One-for-one turn-in process: Broken or damaged gear is brought back to the appropriate department at LOGSU for replacement from stock. After the replacement, the appropriate department either repairs or requests replacement of the broken item to ready it for reissue.
- Survey process: If the item has been lost, the responsible team fills out a DD form 200 explaining the situation, and then obtains approval through the team's chain of command. Based on the cost or classification of the item (unclassified or classified), an investigation might be required prior to replacement. All items above \$2k in value, weapons, or classified equipment require an investigation prior to replacement.

NSW Deployment

Once the NSWRON is ready for deployment, the gear is inventoried and stored in ISUs for transportation to the theater. An ISU is approximately one-third the size of a CONEX box. LOGSU's transportation department coordinates with the U.S. Transportation Command (USTRANSCOM) to transport NSWRON personnel and their gear with the exception of RIP/TOA gear to the theater.

Commander, U.S. Transportation Command's (USTRANSCOM) mission is to provide strategic common-user air, land and sea transportation to deploy, employ, sustain, and redeploy military forces to meet national security objective across the range of military operations. It is comprised of the Air Mobility Command (AMC), Military Sealift Command (MSC), and Surface Deployment and Distribution Command (SDDC). USTRANSCOM normally functions as the supporting command to the geographic commander and serves as the single manager for common-user ports. Each Service specific theater distribution network will use organic transportation resources that are under the operational control of the theater Service component. Combatant commanders may request USTRANSCOM to operate dedicated express transportation to in-theater destinations different from usual aerial and surface points of debarkation. (Perez, Nilsen, Tessier, & Lugo, 2004, p. 6)

In-theater Requisition Process

Due to incompatibility in infrastructure, when NSWRON is assigned to a non-Navy command, the support personnel are required to use the host command's logistics IT systems. They have, however, the capability to access SWALIS remotely. This access allows them visibility to stateside assets and gives the ability to add or remove items as needed in theater. For this particular example, NSWRON X was under the control of Special Operations Command, Africa (SOCAFRICA) (an Army command). NSW Logistics Combat Service Support (CSS) personnel deployed with NSWRON must use the Army's requisition system Standard Army Retail Supply System (SARRS) to track its requisitions or use DD form 448 (Military Interdepartmental Purchase Request (MIPR)). DD form 448 is used to procure supplies or services. It is also used to transfer funds from other services. In addition to this, they also rely heavily on GCPC, Field Ordering and Paying Agent (FOO/PA), garrison reach-back, and in-theater contracts (husbanding agents) (Exhibit 9).

NSWRON teams and units are responsible for maintaining their gear inventory by using DD form 1149 as their primary inventory document. As the items get consumed, damaged, or lost, they are responsible for notifying Logistics CSS for replenishment or replacement. The in-theater CSS procurement process is slightly different from that on stateside. Team or individual gear replacement happens through CSS versus LOGSU. Due to time and geographic constraints, local resources are evaluated first, and if comparable items are available locally they are purchased using GPCP or FOO/PA. To minimize disruption to the mission, the goal is to have the gear fixed or replaced through the fastest means possible. A GCPC single purchase limit can be increased up to \$25k with proper TYCOM approvals. They still have to follow the same One-for-one exchange or Survey process for replacements. If the item cannot be procured locally, CSS reaches back to stateside LOGSU for procurement. This process is known as garrison reach-back. Once the item is procured, LOGSU ships the item to the deployed unit using DHL delivery service.

Return to Homeport

Prior to returning from deployment, NSWRON first goes through the RIP/TOA process for custody turnover of all equipment and gear that is to remain in-place in the theater of operations for the incoming squadron. Meanwhile, LOGSU's transportation department coordinates with USTRANSCOM to transport NSWRON personnel and their gear back to homeport. Upon return to homeport, NSWRON teams and personnel return all TOA-issued gear back to LOGSU. This process is the reconciliation process, and a joint inventory of all of the issued items is conducted by both the appropriate departments in LOGSU and the teams. All DD form 1149s are then verified against SWALIS's electronic database. The returned equipment and gear goes through the Expeditionary Logistics Overhaul (ELO) process. During this process, LOGSU departments identify the gear that needs repair or reconditioning, is missing, or needs replacement. Each department has qualified technicians capable of repairing and reconditioning TOA gear. Items missing or beyond repair are immediately processed for replacement using the survey process (DD form 200) and are submitted to Supply for procurement. The ELO

process is a cost savings process. The process allows LOGSU to efficiently and cost-effectively have the gear ready for the next deployable NSWRON.

Exhibit 1 LOGSU Materiel Losses (from LOGSU1, 2014)

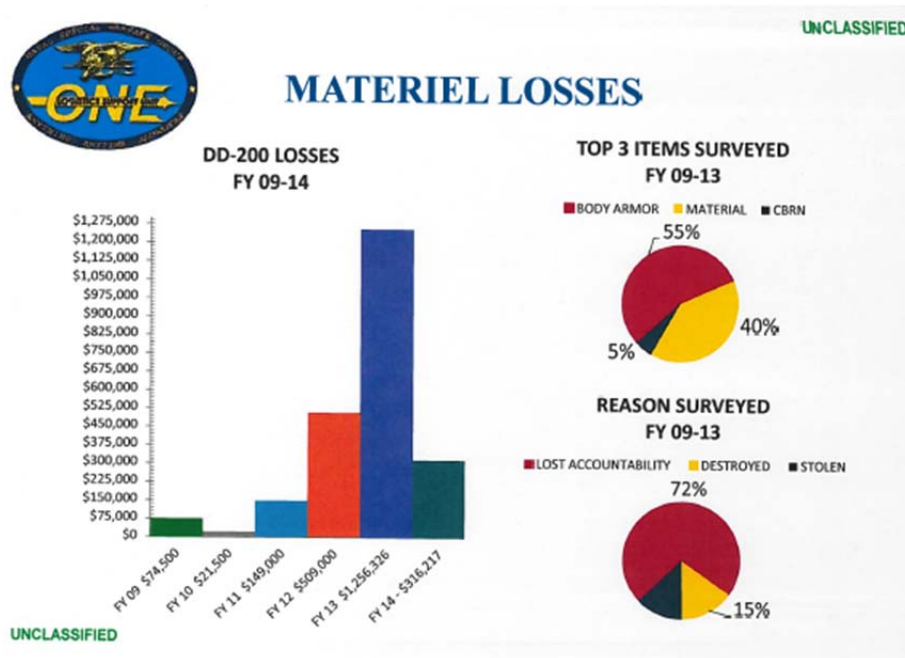


Exhibit 2 Theater Special Operations Commands (NKO, 2014)



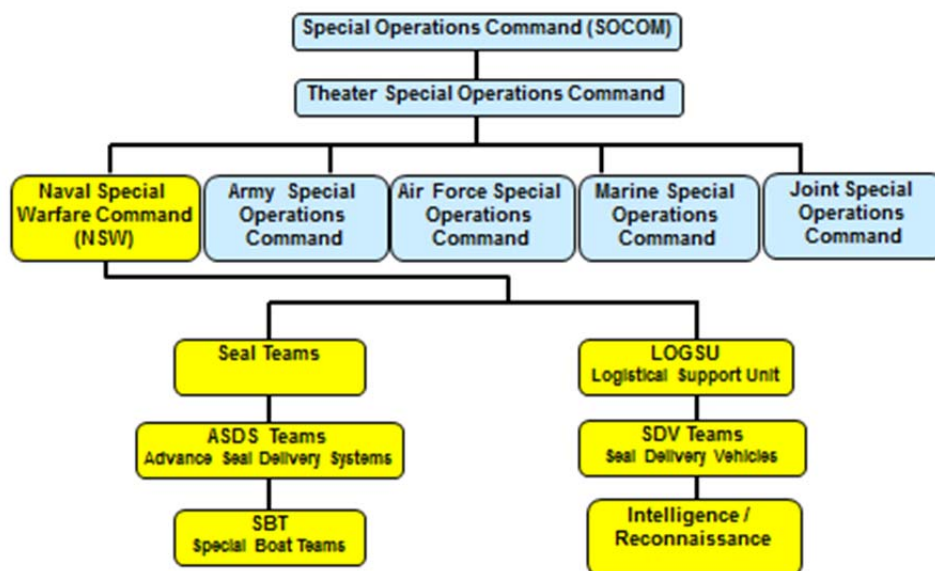
Theater Special Operations Commands (TSOC) are considered geographic experts for all special operations in their theater. They report to their geographic combatant commander and are responsible for planning, preparation, and command and control of Special Operation Forces (SOF) from the Army, Navy, Marines, and Air Force (USSOCOM, 2012).

Special Operations Command, Africa (SOCAFRICA) is located in Stuttgart, Germany and is a sub-unified special operations command for Africa. SOCAFRICA's primary task is to support AFRICOM's mission with the full spectrum of Special Operations Forces capabilities. These include civil affairs, information operations, theater security cooperation, crisis response, and campaign planning (Pike, 2013).

Mission

United States Africa Command, in concert with interagency and international partners, builds defense capabilities, responds to crisis, and deters and defeats transnational threats in order to advance U.S. national interests and to promote regional security, stability, and prosperity.

Exhibit 3 NSW Organization Structure (after NKO, 2014)



NSW Organization Structure (after NKO, 2014).

Exhibit 4 Naval Special Warfare Capabilities

SEAL Teams: SEAL stands for Sea, Air, and Land. They are considered the NSW's Special Operations Force who engages in combat operations. NSW has ten navy SEAL teams (Figure 5): the odd-numbered Teams (1, 3, 5, 7, and 17) are located in Coronado, California, and the even-numbered teams (2, 4, 8, 10, and 18) are located in Little Creek, Virginia.

Special Boat Teams (SBT): Their primary mission is to support special operations missions on the rivers and coasts using specialized high performance, low-profile combat crafts. They are capable of stealthy insertion and extraction of SEALs, covert reconnaissance, and combat gunfire support.

Logistics Support Units (LOGSU): They are regionally located on both coasts and are capable of providing full logistics support to their respective NSW groups (NSWG). They provide logistics support in the following functional areas: supply, contracting, service, combat systems, facilities management, combat service support, medical, communications, and transportation.

SEAL Delivery Vehicle Teams (SDVT): Their primary mission is to provide a long range under water stealthy delivery system to SEAL teams. They deploy with the SEAL teams on specially modified submarines. The submarines are capable of supporting SEAL Delivery Vehicles (SDV), Dry Deck Shelters (DDS), and the Advanced SEAL Delivery System (ASDS). SDVs are small wet submersible vehicles, where the swimmers are exposed to water. Their sole purpose is to increase the speed and range for the swimmers. DDSs are the removable modules that attach to the submarine, allowing the divers to enter or exit submarines while submerged. ASDSs are mini submarines capable of carrying up to 16 SEALs.

Exhibit 5 NSWRON Deployment Cycle (from NWP 3.05.41, 2010)

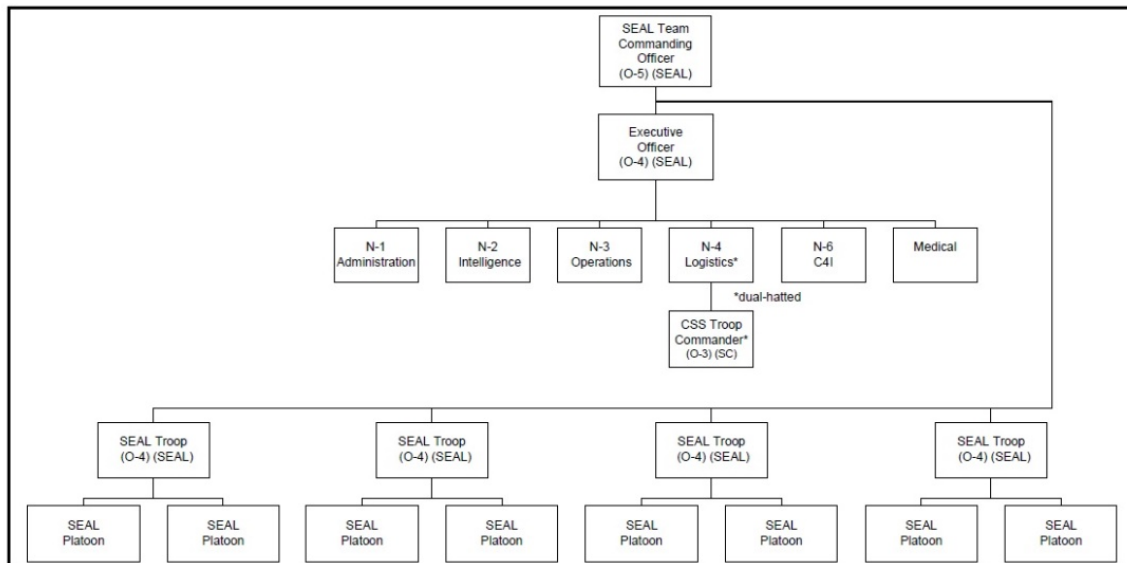
24 MONTH DEPLOYMENT CYCLE - TRAINING (IDTC) & DEPLOYMENT																							
PRODEV						ULT						SIT						DEPLOY					
Professional Development Individual Training						Unit Level Training						Squadron Interoperability Training						Deployment					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
SEAL Team																							
						NSW Squadron																	
						Task Group																	
						NSW SEAL Troops																	
						Task Units																	
						NSW CSS Troop																	
						CSS Detachments																	
						NSW SEAL Platoon/Detachment																	
						Task Element																	

Exhibit 6 NSW Mission Range (NKO, 2014)



- 1) **Combating terrorism** is comprised of antiterrorism (defensive actions) and counterterrorism (offensive actions).
- 2) **Counter-proliferation** of weapons of mass destruction (WMD) is comprised of the actions taken to seize, destroy, capture, or recover WMD.
- 3) **Direct action** is comprised of short strikes, raids and ambushes, standoff attacks, recovery operations, precision destruction, anti-surface warfare, and amphibious warfare.
- 4) **Special reconnaissance** is comprised of environmental reconnaissance, armed reconnaissance, coastal patrol and interdiction, target and threat assessment, and post-strike reconnaissance.
- 5) **Unconventional warfare** is a broad spectrum of military and paramilitary operations predominantly conducted by indigenous forces. These include guerrilla warfare, covert or clandestine operations, subversion, sabotage, and support of evasion and escapes.
- 6) **Physiological/information warfare** induces or reinforces foreign civil or military attitudes and behaviors favorable to our objectives.
- 7) **Foreign Internal Defense** is the organization, training, advising, and assisting the host nation (HN) military and paramilitary forces to maintain internal stability.

Exhibit 7 NSW Squadron Structure (NWP 3.05.41, 2010)



NSWRON is comprised of eight SEAL platoons. Platoon size is approximately 14-21 people. Based on a mission, platoons can be structured to operate as 8-man Squads, 4-man Fire Teams, or 2-man Sniper/Reconnaissance Teams (NWP 3.05.41, 2010).

Based on the theater or mission requirements, NSWRON generally deploys with additional resources from outside the Teams:

- Additional CSS personnel (from LOGSU, IA, and/or Reserves): 15–40 personnel
- Communications Troop (sourced from Mobile Comms Team): 20–24 personnel
- Military Working Dog (MWD) and Handler (SA-1/SA-2): 2 handlers per team
- UAV Detachment (SA-1/SA-2): varies
- RIB Detachment (from SBT): 12 personnel for every 2 RIBs
- EOD (from EODMU): 4–8 EOD techs
- Intel Support Augments (various sources): 2–5 personnel
- Mobile Field Surgical Team (MFST) and/or Critical Care Evacuation Team (CCET): approximately 12 people

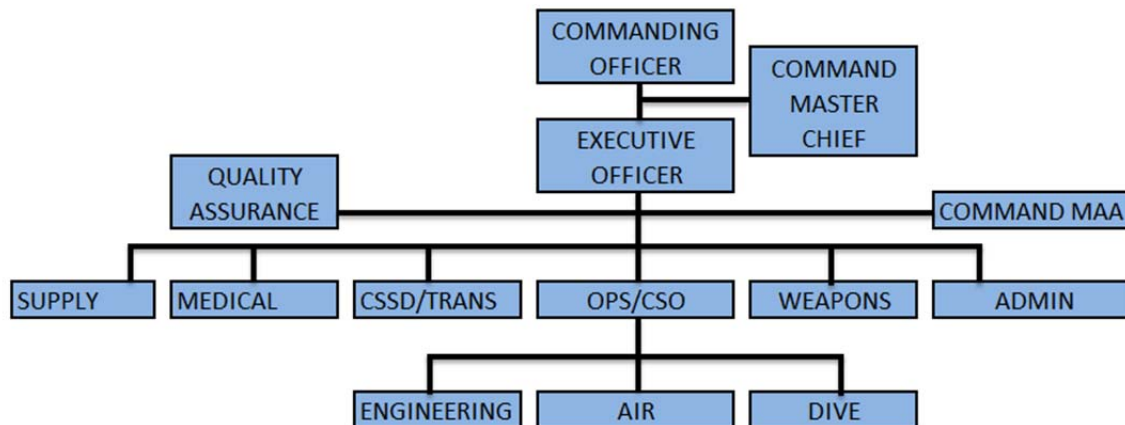
EXHIBIT 8 Types of Gear

- 1) **PGI:** This refers to organizational clothing and equipment issued to an individual while checking into expeditionary command. When standard uniform items are deemed inadequate, PGI gear is specifically designed to provide personal protection during training, combat, and in hostile environments. Examples of gear are: Uniforms, Cold weather gear, Wet or Dry suits, etc.
- 2) **TOA:** This is the listing of approved equipment and materiel required by NECC and NSW units to perform their missions in contingency, wartime, and disaster recovery operations. TOA developed is supported by three documents: Required Operational Capability (ROC), Projected Operational Environment (POE), and Navy Mission Essential Task List (NMETL). TOA listing varies based on the unit's primary capabilities and mission statement. TOA is designed to support all unit requirements for 60 days with the exception of food and fuel—supported for 15 days. TOA does not support ammunitions. Examples of these are: Weapons, Specialty tools and Equipment, Body armor, etc.
- 3) **MFP-11 gear and equipment:** USTEDA is an authorization document for MFP-11 gear and equipment. MFP-11 gear is specifically for NSW forces. It includes mission-specific items not part of PGI or TOA. Rather, they are needed by Special Operations Forces (SPEC OPS) to complete its mission. Equipment includes Unmanned Aerial Reconnaissance Vehicles, SPEC OPS specific weapons, etc.

EXHIBIT 9 Types IT Systems and Procurement Processes

- 1) **R-Supply**: computer based system used by both EOD and NSW. It serves as their primary system to manage maintenance, supplies, NSN requisitions, budgeting, and financial reporting.
- 2) **WASP**: stand-alone commercial off-the-shelf inventory management software that is used as the primary inventory management system (EODESU). The system was implemented in 2010 and serves as EODESU's primary inventory and warehouse management system. WASP is not part of the navy program of record, and it is a non-networked local system that does not allow asset visibility outside the command. It does come with capabilities: barcode scanner, barcode labeling software, and basic inventory / asset tracking that allows EODESU to manage its inventory much more efficiently. Prior to WASP, the primary method used to manage inventory was MS Excel spreadsheets.
- 3) **SWALIS**: developed and fielded for U.S. Special Operations Command (USSOCOM) to provide Total Asset Visibility (TAV) across the NSW enterprise. LOGSU uses this system to primarily manage PGI and TOA gear for NSW forces. SWALIS is DODAF-compliant and WLAN-capable. It allows NSW forces to have real-time visibility on load-out status and locations of all mission critical equipment.
- 4) **SPEAR**: system used by NSW LOGSUs to manage body armor systems, protective eyewear, and Protective Combat Uniform (PCU).
- 5) **MICAS**: automated system used by LOGSU to track shelf-life and inventory of Chemical Biological and Radiological (CBR) individual protective Equipment for NSW forces. It provides centralized management of CBR assets. This also means centralized reporting capability, increased data accuracies, and improved efficiencies in asset visibility and shelf-life management.
- 6) **Garrison reach-back**: when deployed units are unable to obtain material or equipment locally, they communicate their needs to the stateside Logistics Support Unit (LSU). LSU is capable of shipping the material worldwide using DHL carrier.
- 7) **GCPC**: based on established spending limits, this allows authorized personnel to make micro-purchases to support one's expeditionary units.
- 8) **FOO/PA**: FOO is an individual authorized by the contracting officer in writing to execute purchases using Standard Form (SF) 44. PA is an individual appointed in writing to pay for FOO authorized purchases with cash and other negotiable instruments.
- 9) **OPCON/TACON system/process**: this process is determined by the specific military service serving as a theater operation command. For example, army uses Standard Army Retail Supply System (SARRS) for all of its requisition processes; whereas, marines use Asset Tracking Logistics and Supply System (ATLASS).

Exhibit 10 LOGSU Command Structure (from LOGSU1, 2014)



B. EXPLOSIVE ORDNANCE DISPOSAL LOGISTICS STUDY

A request for EOD forces has been generated for the CENTCOM AOR (Exhibit 1). A Force Tracking Number (FTN) has been identified by the Navy and assigned to EODGRU ONE. The FTN describes the details of when, what, where, and how many people are needed to accomplish the current mission. The primary mission in this case is to counter IED and mine sweeping operations.

EODGRU ONE has accepted the task order and has assigned it to EOD Mobile Unit Y. There are 8-10 platoons within an each mobile unit, and each platoon is composed of 6-8 EOD techs. EOD Mobile Unit Y is responsible to assign a platoon with the right capabilities for the task. All platoons routinely undergo a repetitive training cycle to ensure readiness and familiarity with equipment before they are they are ready to deploy.

Expeditionary Support Unit

EODESU ONE plans, coordinates, integrates, synchronizes, and provides total logistics support (TLS) for the EODGRU and the subordinate units that are preparing for or in a deployed status. The Expeditionary Support Unit command structure is broken down into seven departments with specific functions: administrative, operations, civil engineering support equipment (CESE), supply, craft, material, and medical (Exhibit 2). Each department provides a unique support capability to EODGRU forces but our

primary focus for this case study is supply and materiel's department. The majority of the inventory materials are managed between the Supply and Materiel departments. The Supply department is the principal financial, procurement, inventory, and customer service managers within the command. Both Supply and Materiel departments maintain separate warehouses; Supply manages PGI gear (Exhibits 3, 5) and Materiel manages TOA gear (Exhibit 4, 5).

Supply Department

The Logistics specialists (LS) use R-Supply to manage financial and requisition data. They use WASP—a commercial off-the-shelf system—to manage the warehouse inventory. Prior to WASP they used Microsoft Excel as their primary inventory management system. To improve efficiency and inventory accuracy, WASP was adopted by the command as the primary inventory management system. WASP is not part of the navy program of record and is a non-networked local system that does communicate nor allow asset visibility outside the command.

Supply's primary source for acquiring all PGI gear is the NECC's Central Issuing Facility (CIF). The CIF provides central management by using a web-based automated system that keeps track of gear requisitions. The CIF operates on a walk-in first-come first-serve basis and the average time to fulfill a requisition requirement is typically between 2–4 weeks. The process initiated when Supply personnel prepared a requirement request document and then transported the document to the closest Central Issuing Facility. To date, there are two CIF locations: one is in Port Hueneme, California—roughly 450 miles away from EODESU ONE in Coronado, California—and the other is located in Virginia Beach, Virginia. Due to 450 mile distance from CIF, EODESU ONE has to maintain large quantity of PGI gear onsite to improve customer wait time and ensure readiness.

Materiels Department

The materiel department is controlled mostly by non-supply rated EOD technicians and they use WASP as their primary inventory management system. This process is initiated after the material department receives an authorized TOA listing both from Readiness

and Cost Reporting Program (RCRP) and from end user feedback. To maintain readiness, NECC requires the command to maintain an adequate inventory through RCRP at all times. RCRP provides capabilities to satisfy the readiness and logistics needs of Navy Expeditionary Combat Command (NECC) operating forces. RCRP is a readiness reporting system, which provides NECC forces with a standardized, enterprise-wide capacity to measure, display, and report the readiness status of Personnel, Equipment, Supply, Training and Ordnance.

ESU Gear Issue Process

PGI and TOA gear is assigned a year out from deployment. This gives the assigned platoon an opportunity to train with their assigned equipment. Mobile units tell the ESU what they need for deployment. They go to either the supply or material department to submit requirement request using a manually generated DD Form 1149 (Requisition and Invoice/Shipping form). Each department would then check its system (WASP) for the items they may have in stock.

If a special requirement arises for a non-carried piece of equipment, the ESU can appropriate the material to fulfill the requirement using various procurement methods. These include NSN requisitions through the navy supply system and open purchases using government credit card (GPCP).

The NSN requisition process is quite simple. When a logistical specialist (LS) using R-supply generates a requisition and electronically releases it to navy supply system for fulfillment; the obligated funds are automatically subtracted from the commands' total budget. Once the requisitions are received at navy's warehouse, R-supply automatically assigns them a location either for stocking in the warehouse or for issuing to the respective department.

Contracting support is provided by NAVSUP Feet Logistical Center San Diego / Norfolk. A Contracting Review Board (CRB) is held at NECC N41 to validate the requirement. Any single purchase over \$3K, or for a period of performance greater than 90 days, will require a contract to go through the contracting department. To initiate an

open purchase, LS obligates funds in R-Supply to the GCPC line of accounting or the contract line of accounting. Then the commercial source is paid using a GCPC. It does not authorize to pay the source without obligating money in R-supply first. Once the product is received from the vendor, it is confirmed in R-supply and is manually entered into the WASP inventory management system. From that point onwards, all tracking, issuing, and inventorying is maintained until ready for issue.

When compared to standard fleet requisition processes, the expeditionary requisitions processes are unique: over 95% of the fleet requisitions are filled through navy supply system using National Stock Number (NSN), and less than 5% are open purchases. Whereas, in expeditionary logistics approximately, 70% of the requisitions are open purchases and only 30% are NSN requisitions (NKO, 2014).

Training Cycle

During the training cycle, if the gear gets damaged, lost, or consumed, the designated team member or an individual goes back to the ESU for replacement gear.

Replenished, damaged, or lost items will be replaced through a one-for-one turn-in process or survey process using a DD form 200 (Financial Liability Investigation of Property Loss).

One-for-one turn-in process: The broken or damaged gear is brought back to the appropriate department at ESU for replacement from stock. After the replacement, the appropriate department either repairs or requests replacement of the item to get it ready for reissue.

Survey process: If the item is lost, the appropriate team fills out a DD form 200. In the form, the team explains the situation and obtains approval through its chain of command. Based on the cost or classification of the item (unclassified or classified), an investigation might be required prior to replacement. All items above \$2K, weapons, or classified equipment require an investigation prior to replacement.

Final Evaluation Phase (FEP): A phase in the Mobile unit training cycle where the platoon must effectively execute a variety of scenarios they will likely come across in a

deployed environment to the satisfaction of NECC Expeditionary Training Group. This must be accomplished before receiving certification for deployment.

One of the most critical areas within this cyclical process is the ability to sustain during the present mission.

Deployment

Mobile Units are responsible for maintaining their gear / inventory using DD form 1149 as their primary inventory document. As items deteriorate through normal wear and tear, get damaged, or lost, they are responsible for notifying the Expeditionary Support Element (ESE) officer in charge—led by a Supply Corps Officer. The ESE serves as a small scale element of an ESU that is integrated with Mobile Unit Y and provides forward support. In theater, the ESE procurement process is slightly different from stateside. The goal is always to provide a wide range of support whether organic or outsourced through the fastest means possible. GCPC single purchase limit can be increased with proper TYCOM approvals.

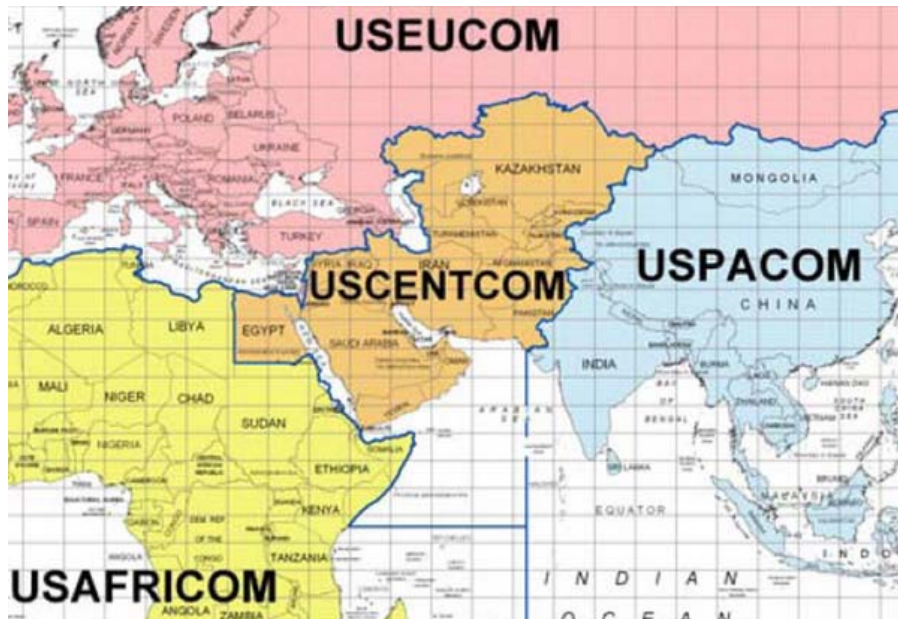
The same One-for-one exchange or Survey process for replacement items still applies. If compatible, local resources are gauged first and are purchased using the GPCP. If the local environment does not have a compatible replacement, the ESE will reach back to stateside ESU for procurement. This process is known as garrison reach-back. Once the item is procured, the EODESU ship the item to the deployed unit using DHL delivery service.

The Return Home

EOD Mobile Unit Y has returned from their six-month deployment. They deployed with a significant amount (8-10 ISU containers) of equipment which is required to be returned to Supply for reconditioning and reissue. The team is currently returning issued equipment to supply and discovered a 30-35% loss of accountability. This loss is not unique; rather, is considered typical.

All issued TOA material is cycled back to the Material department. This is referred to as a reconciliation process, during which an 1149 Requisition and Invoice/Shipping Document is verified against their electronic data base in WASP. During the reconciliation process, the TOA gear goes through Expeditionary Logistics Overhaul (ELO). This is similar to the Integrated Logistics Overhaul (ILO) process that happens on board ships when they enter an overhaul period. During this process, the Material department identifies the gear that needs to be repaired, reconditioned, or replaced. EOD techs have the capability to repair and recondition TOA gear. Damaged material is immediately processed for either repair or replacement to get ready for the next deployable platoon. Any items gone missing or that are beyond repair require a survey document (DD form 200) and submitted to Supply for procurement.

EXHIBIT 1 CENTCOM AOR



(from CENTCOM, n.d.)

EXHIBIT 2 EODESU COMMAND STRUCTURE (EODESU1, 2014)

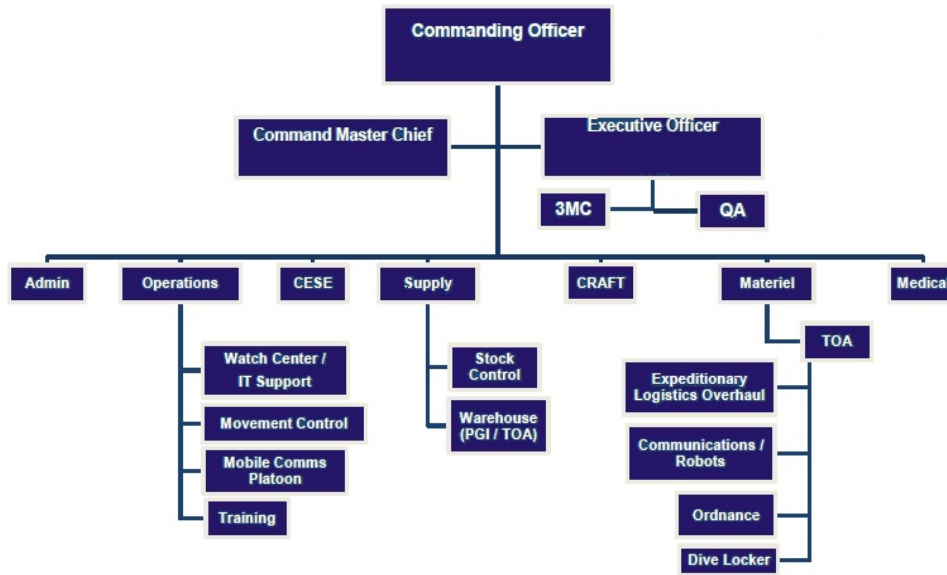


EXHIBIT 3 Sample PGI Listing (EODESU1, 2014)

COG	NSN	DESCRIPT	UI	QTY	WEIGHT	CUBE(CF)	NSN EXT	ASSY EXT
9ED	4240-01-361-1319	CANISTER CHEMICAL-BIOLOGIC EA		2	0.1	0.0766	25.62	15141.42
ONC	4240-LL-LCX-0109	MASK CHEMICAL-BIOLOGICAL EA		1	2	0.7653	600	354600
ONL	8415-LL-LCX-0002	COAT CHEMICAL PROTECTIVE (EA		2	6.56	0.7776	232.8	137584.8
ONL	8415-LL-LCX-0003	TROUSERS CHEMICAL PROTECT PR		2	7.8	2.6666	276.84	163612.4
ONL	8415-LL-LCX-0004	GLOVES NUC-BIO-CHEM CONT PR		2	0.9	0.0198	51.74	30578.34
ONL	8415-LL-LCX-0005	GLOVES INSERTS NUC-BIO-CHE PR		2	0.5	0.0182	10.98	6489.18
ONL	8430-LL-LCX-0006	OVERBOOT LIGHTWEIGHT NUC PR		2	3.5	0.8312	71.84	42457.44
9BD	8465-00-860-0256	COVER CANTEEN WATER OLIVE EA		1	0.25	0.0364	5.89	3480.99
9BD	8465-01-115-0026	CANTEEN WATER PLASTIC 1QT EA		1	0.5	0.0781	5.25	3102.75
9BD	8465-01-322-1965	BELT INDIVIDUAL EQUIPMENT EA		1	0	0	14.45	8539.95
9BL	8465-01-500-5485	BAG NUCLEAR BIOLOGICAL & C EA		1	4	1.546	107.87	63751.17
9BL	6545-01-566-4797	INDIVIDUAL MEDICAL ASSAULT EA		1	2	0.0954	224.53	132697.2
9BD	8470-01-534-0777	CARRIER, SMALL ARMS PROTECT EA		2	2	0.1852	625.24	369516.8
9BW	8470-01-540-6532	INSERT SMALL ARMS-INSERT, S EA		2	4.5	0.0554	496.72	293561.5
ONL	8470-LL-LCX-0011	INSERTS ESAPI EA		2	0	0	1015	599865
ONL	8470-LL-LCX-8109	MAR-CIRAS KIT INCLUDING SOF KT		1	0	0	2300	1359300
9BL	5855-LL-LCC-9024	MOUNT NVG 1HOLE G37 TAN EA		1	0	0	639.28	377814.5
9BH	6220-01-549-4184	LIGHT F/HELMET (RED-WHITE-B EA		1	0.5	0.0065	0	0
9BD	8415-01-524-5842	BAND HELMET CAMOUFLAGE (F EA		2	0	0	1.88	1111.08
ONW	8415-LL-LCX-0137	COVER HELMET NAVY WORKIN EA		1	0	0	13.14	7765.74
ONW	8415-LL-LCX-0138	COVER HELMET NAVY WORKIN EA		1	0	0	13.14	7765.74
9BW	8470-LL-LCX-8087	HELMET, GROUND TROOPS ECH EA		1	5	0	733.65	433587.2
ONL	8125-LL-LCC-4312	BOTTLE WIDE MOUTH 32OZ. LO EA		1	0.5	0.1446	9.5	5614.5
ONL	8125-LL-LCC-4319	PARK WATER BOTTLE 1 LITER D EA		1	0.25	0.2083	20	11820

EXHIBIT 4 Sample TOA Listing (EODESU1, 2014)

NSN	DESCRIPTION	UI	QT Y	WEIGHT(LB)	CUBE(CF)	NSN EXT COST
8340-LL-LCC-2986	BOOT TENT SIDE DOOR TO DOME DOOR OD SERIES 100-300	EA	1	19	3.3541	535
8340-LL-LCC-4426	FLOOR TENT 9.5X25FT GRAY F/BX 105 TENT READY FOLD	EA	1	200	12.5	2240
8340-LL-LCC-6215	FLOOR TENT FOR CONNECTOR BOOT DOME TO NON-DOME	EA	1	5	0.3333	42.75
3990-LL-LCC-3885	JACK LEVELING KIT AAR	EA	8	0	0	25345.2
4510-LL-LCC-2901	EISU-90 LATRINE 6 HEAD AAR	EA	1	6985	495	90687.9
6150-LL-LCC-4597	CABLE POWER TWISTLOCK 30A 100FT AK	EA	2	32	10.5	618
5430-LL-LCC-3876	TANK PILLOW WATER 1000 GAL	EA	2	180	1080	4066
6780-LL-LCC-3745	HOSE DRAIN/WASTE 30FT (AAR)	EA	1	0	0	398.44
2930-LL-LCC-3750	PUMP WATER GRAY AAR	EA	1	0	0	806.37
3990-LL-LCC-3885	JACK LEVELING KIT AAR	EA	8	0	0	25345.2
5430-LL-LCC-3876	TANK PILLOW WATER 1000 GAL	EA	2	180	1080	4066
4510-LL-LCC-2900	EISU-90 SHOWER 6 HEAD AAR	EA	1	6800	495	85966.61
6150-LL-LCC-4597	CABLE POWER TWISTLOCK 30A 100FT AK	EA	2	32	10.5	618
6780-LL-LCC-3746	HOSE SHOWER GRAY WATER WASTE EISU90 (AAR)	EA	1	0	0	221.76
2930-LL-LCC-3750	PUMP WATER GRAY AAR	EA	1	0	0	806.37
2840-LL-LCC-3753	GENERATOR SYSTEM ISO BICON MOUNTED 60KW	EA	1	14000	564	136894

EXHIBIT 5 Types of Gear (NKO, 2014)

- 1) **PGI:** This refers to organizational clothing and equipment issued to an individual while checking into expeditionary command. When standard uniform items are deemed inadequate, PGI gear is specifically designed to provide personal protection during training, combat, and in hostile environments. Examples of gear are: Uniforms, Cold weather gear, Wet or Dry suits, etc.

- 2) **TOA:** This is the listing of approved equipment and materiel required by NECC and NSW units to perform their missions in contingency, wartime, and disaster recovery operations. TOA developed is supported by three documents: Required Operational Capability (ROC), Projected Operational Environment (POE), and Navy Mission Essential Task List (NMETL). TOA listing varies based on the unit's primary capabilities and mission statement. TOA is designed to support all unit requirements for 60 days with the exception of food and fuel—supported for 15 days. TOA does not support ammunitions. Examples of these are: Weapons, Specialty tools and Equipment, Body armor, etc.

EXHIBIT 6 Types IT Systems and Procurement Processes (NKO, 2014; EODESU1, 2014; LOGSU1, 2014)

- 1) **R-Supply:** computer based system used by both EOD and NSW. It serves as their primary system used to manage maintenance, supplies, NSN requisitions, budgeting, and financial reporting.
- 2) **WASP:** stand-alone commercial of the shelf inventory management software that is used as the primary inventory management system (EODESU). The system was implemented in 2010 and serves as EODESU's primary inventory and warehouse management system. WASP is not part of the navy program of record and it is a non-networked local system that does not allow asset visibility outside the command. It does come with capabilities: barcode scanner, barcode labeling software, and basic inventory / asset tracking that allows EODESU to manage its inventory much more efficiently. Prior to WASP, the primary method used to manage inventory was MS Excel spreadsheets.
- 3) **SWALIS:** developed and fielded for U.S. Special Operations Command (USSOCOM) to provide Total Asset Visibility (TAV) across the NSW enterprise. LOGSU uses this system to primarily manage PGI and TOA gear for NSW forces. SWALIS is DODAF-compliant and WLAN-capable. It allows NSW forces to have real-time visibility on load-out status and locations of all mission critical equipment.
- 4) **SPEAR:** system used by NSW LOGSUs to manage body armor systems, protective eyewear, and Protective Combat Uniform (PCU).
- 5) **MICAS:** automated system used by LOGSU to track shelf-life and inventory of Chemical Biological and Radiological (CBR) individual protective Equipment for NSW forces. It provides centralized management of CBR assets. This also means centralized reporting capability, increased data accuracies, and improved efficiencies in asset visibility and shelf-life management.
- 6) **Garrison reach-back:** when deployed units are unable obtain material or equipment locally; they communicate their needs to the stateside Logistics Support Unit (LSU). LSU is capable of shipping the material worldwide using DHL carrier.
- 7) **GCPC:** based on established spending limits, this allows authorized personnel to make micro-purchases to support one's expeditionary units.

- 8) **FOO/PA:** FOO is an individual authorized by the contracting officer in writing to execute purchase using Standard Form (SF) 44. PA is an individual appointed in writing to pay for FOO authorized purchases with cash and other negotiable instruments.

- 9) **OPCON/TACON system/process:** this process is determined by the specific military service serving as a theater operation command. For example, army uses Standard Army Retail Supply System (SARRS) for all of its requisition processes; whereas, marines use Asset Tracking Logistics and Supply System (ATLASS).

V. ANALYSIS, RECOMMENDATIONS, AND CONCLUSIONS

This chapter analyzes the situations described in the previous case studies and describes the issues identified during this study's research. Additionally, this chapter attempts to answer the questions faced when this research began as well as those that arose, as the research progressed, which seemed to be more at the heart of the issues probed. Finally, recommendations are made that this study's researchers believe will improve the performance of the organizations studied.

During the course of research, the existence of several factors, which unavoidably limited the scope of this research and reduced the confidence in the findings, was recognized. Principally among these was the researchers' limited time available relative to the large scope of the overall project. Although this is the first report in a series that will make up the researchers' ONR project, the limited time constrained this study's focus to look at only two expeditionary communities—and only those two located on the West Coast.

A second limitation was the limited amount of numerical data that was available. This lack of data was attributable to the limited time, the exploratory nature of the researchers' inquiries, and in the case of NSW, the classified nature of the missions. Although this study's researchers believe the findings provide significant value and insight, without the ability to analyze large amount of actual numerical data, it was not possible to definitively identify areas of improvement or quantify the potential improvement. Thus, the findings must be considered preliminary.

A third factor was the choice of communities to study. Although this research only looked into two commands and, given the risks of making judgments based on a sample size of two, the researchers believe that between NSW and EOD, EOD is the more representative example of a typical expeditionary command and the challenges it faces will be more common to the remainder of the NECC subcommands. This is because, as one interviewee stated "NSW is Navy in name only." Because of the high profile and strategic nature of the missions with which they are tasked, they are given

much higher priority and greater resources than the commands of NECC. The missions of the EOD and NSW forces are similar in many aspects and are often complimentary when deployed in the field to achieve a common goal. They are, however, very different in other aspects and this makes the comparison between the two difficult. Besides the nature of their respective missions, the nature of the commands and supporting organizations makes a direct comparison between the two somewhat difficult. NSW is a small organization with high profile and high priority missions. Consequently, it is given more resources than other expeditionary commands and comparing it to EOD may not yield practicable insights. To help mitigate the impact of these limitations, a discussion follows that will present the ways in which the researchers believe they affected the findings. Recommendations for further research will also be presented.

A. ANALYSIS

During the course of this study's research, a number of areas that offered the possibility of improved financial and operational efficiency were identified. When considering the nature of these opportunities and the circumstances that brought them about, it became apparent to the team that several key factors were at work. First among these was the size of the NSW and EOD community (approximately 10,500 personnel (EOD, 2012; USSOCOM, 2012) relative to the size of traditional Navy (approximately 310,000 personnel). Because the expeditionary community makes up a relatively small portion of the Navy in terms of both manning and the number of mission sets to which it contributes, it is likely that the community's requirements are necessarily assigned lower priority than those of the maritime force. The Navy must make choices regarding how it will spend its resources and, like any other organization, it will seek to obtain the most satisfaction from its large, but nevertheless finite resources. Consequently, it is plausible that an organization the size of the Navy would be unable to completely meet the needs of a minority of stakeholder organizations like EOD.

Another factor that contributes to the inefficiencies observed in the case of EOD is the diverse nature of the commands which make up NECC and their relative sizes. NECC is composed of ten separate commands with SEABEES claiming more than half of

NECC's personnel. Although the team was unable to determine if this is true in other areas, indications were received to show that at least on the West coast, this has resulted in the SEABEE culture dominating the NECC community and its requirements being given de facto higher priority.

1. Information Technology (IT) Systems

As previously mentioned, NECC makes up a small portion of the Navy's overall manning. Of this population, EOD personnel are a vanishingly small fraction. Consequently, they are unable to claim funding that would permit them to have a written contract tailored with an inventory management program to meet their needs. As a result, EOD "makes do" with the systems it has: the commonly available commercial products such as WASP for inventory management and navy-approved systems such as R-supply for financial management. WASP was only implemented as an inventory management system less than three years ago. It is an improvement over their previous methods of using Microsoft Excel spreadsheets. The use of multiple systems to perform inventory management results in an ad hoc inventory management system that requires double entries to maintain duplicate databases, as well as extensive, lengthy periods of on-the-job training to master the systems. Likewise, the logistics operations of the NSW community suffer from inefficiencies that also stem from a variety of computer systems required to conduct its business. Multiple systems are required to maintain equipment inventories and specific programs are required to be used for certain categories of equipment. Moreover, none of the databases for these inventory management programs are able to share information with the software used to track finances (R-Supply).

The effect this is having on NSW and EOD logistics operations is reduced efficiency and effectiveness. For a typical Logistics Specialist, a tour in an expeditionary unit is unusual. The requirement to use multiple computer systems negates a key benefit of computer technology by multiplying the work required by the user. The need to perform repetitive data entries is an invitation for natural human error. These inevitable errors also introduce inaccuracies into the inventory, contribute to a loss of accountability, and reduce buying power for the taxpayer.

Most who serve in such a unit do so for only one tour and the majority can spend an entire career on sea-going ships. As a result, the systems LS can expect to encounter in an expeditionary command will be extremely unfamiliar. These programs have no formal Navy training available and the Sailor must learn through on-the-job training for up to 18 months. The USMC, however, utilizes logistics programs along with the associated schools. We recommend further research be conducted to determine if these programs and schools could be adapted for use by Navy.

2. Procurement Methods

This study showed that similar procurement methods are used to appropriate materials and gear within the LOGSU and EODESU. Both rely heavily on open purchases using contracts or government credit card through the commercial sources. The goal is to have the gear fixed or replaced through the fastest means possible. Relying on the readily available product allows them to procure and stay current with technology advancement at a much faster rate in an effort to always stay ahead of the next potential threat.

a. Contracting Support

There is a wide discrepancy in the apparent contracting assistance available to NSW and EOD communities. NSW possess an organic ability to write and administer contracts. This greatly increases the speed with which equipment and services can be obtained while reducing the workload on the unit's logisticians. In contrast, EOD is required to use the contracting services of the Fleet Logistics Center (FLC). This increases delays and administrative workload. This study's team recommends conducting further research to explore methods that could give other expeditionary units contracting abilities more comparable to those of NSW.

b. Reliance on Commercial Equipment and Government Purchase Card

There is a demand for cutting-edge equipment among members of the NSW and EOD communities. This compels their logistics support units to rely heavily on the use of their government purchase card (GPC.) The Navy's supply system is best suited to

providing parts and equipment to traditional ships and submarines. Relative to NSW and EOD, these platforms face threats and challenges that change slowly and, consequently, their equipment is similarly slow to change. This is not the case with expeditionary units. They operate in a more dynamic environment. While a ship may have a service life of up to 50 years, much of the equipment used by EOD and NSW has a service life of only months. This timeframe does not permit economical parts support. Incorporating this into the traditional maintenance model of a sea-going ship could be meaningful. The GPC permits these commands to obtain the required equipment quickly, but this does not come without consequence. The process of purchasing with Government Purchase Card records purchases information in a form that is not readily accessible to external organizations. For example, the total dollar amount spent on a purchase is recorded in one system; however, purchased items get recorded individually into a different system. The two systems are not compatible. The amount spent and the list of items on that purchase can only be reconciled manually by reviewing the original receipt. As a result, demand history is lost along with the ability to easily audit expenditures. This study's team recommends that research be performed to develop systems or methods that would enable the information about purchased items to be more readily and centrally available.

c. Difficulty Maintaining Accountability for Equipment

The process used to issue and maintain accountability of equipment is inadequate, particularly during a unit's deployment. Based on the preliminary information available at the time of this research and the interviews of subject matter experts, this study's researchers estimated that loss of material accountability is approximately 70% for NSW and 35% for EOD. This is attributable to the methods used to assign and record accountability for equipment, the relative ease with which equipment can be replaced, and the inability to detect trends in purchases and/or surveys.

Prior to deployment, accountability for the equipment is assigned to an individual or team using a paper DD form 1149. During the NSW or EOD deployment, no supply or logistics personnel from the team's unit are deployed with them to provide support to deployed equipment and, as a result, the responsibility for maintaining custody falls to

the Combat Service Support team (CSS) in theatre. The CSS is required to do these using suboptimal methods such as Excel spreadsheets or a locally maintained database. It should be noted that even when the database is a familiar program, if the unit is being deployed with another service, the unit will be required to use that service's program. This introduces inefficiencies and reduces effectiveness in a manner similar to that previously described.

While deployed, the teams' focus understandably shifts to the successful accomplishment of the mission. Equipment, however, can be damaged or lost and replacements are obtained from respective in-theater logistics support units to ensure maximum readiness. This use of locally deployed support personnel helps the team maintain its capability to accomplish assigned tasks. It is likely, however, that by separating the functions that maintain accountability from the equipment, a culture in which material costs are not a major concern could be created.

The paper DD 1149 records are maintained at the team's homeport and are unable to be updated when equipment is lost/destroyed and subsequently replaced. Additionally, because gear that is deployed with a unit is by definition "mission essential," replacing it is a high priority. Consequently, a given piece of equipment may be replaced several times during a deployment, but it is only upon the team's return to home port that its equipment and equipment inventory records are reconciled. Some gear is deployed and returns with an individual Sailor or unit and discrepancies will be detected after the six-month deployment is concluded. As described previously, however, because these purchases are likely to have been made using a GPC, the record of any replacements purchased during this time is largely obscured.

Additionally, a significant amount of equipment will only be reconciled after 18 months or may never be reconciled at all. Certain pieces of equipment are too costly to warrant purchasing in quantities sufficient to provide to each unit or too large to economically deploy and redeploy with a designated unit. This equipment is designated RIP/TOA and is turned over in theatre as units are relieved. Although this equipment may have a high value, because it may be more than a year since accountability was first

assigned and procuring replacements for deployed equipment is relatively easy, this equipment may never be reconciled but simply “written off.”

Because the method required to document and track equipment loss/damage relies upon hard copy paper documentation, it is likely that there is no effective means to accurately determine the cause of the loss/damage. Also, because of the nature of the control systems in place and the culture and attitudes it may engender, it is also unlikely that individuals with assigned accountability will be held accountable in the event of loss or damaged equipment. Lost, destroyed, and unserviceable equipment is properly recorded using the DD form 200. These forms, however, are produced at a rapid rate and the logistics units require several large binders to maintain a record of these forms. The documentation process is methodical. It is likely, however, that the sheer volume of paperwork makes it very difficult to assure accuracy in individual cases and to discern long-term patterns. Instead, the skill and memories of the unit’s leaders and Sailors become the primary means for detecting trends. The reliance on paper forms and the volume with which they are produced places a significant administrative burden on the NSW and EOD logistics support commands while simultaneously obscuring trends in the information these forms record. It is probable that these factors make it unlikely that an individual Sailor will suffer any consequences in the event of a loss of accountability. This is because the same factors also make it difficult to detect a loss due to negligence or theft. The systems may also create the perception that the forms are a “paperwork drill.” With this perception, it is likely Sailors prioritize their core responsibilities above any fiduciary accountability they may be assigned. In such an environment, it would also be inappropriate to punish the Sailor for responding to the incentives which he has been given.

This study’s researchers recommend further study be performed to ascertain the attitudes of Sailors in the EOD and NSW commands and assess the culture of these organizations with regard to material accountability and the IT systems used to manage it. This study also recommends further research into the feasibility of developing and implementing a computer-based accountability system. This could reduce the

administrative burdens of the current paperwork systems while enhancing the ability to maintain accurate records of equipment.

B. CONCLUSION

While the research conducted has been necessarily limited in scope, we believe it clearly suggested there may be significant opportunities to realize increased cost savings across the expeditionary communities. The preliminary nature of our inquiries indicate cause for further study to validate our assessment and conclusions. Additionally, our inquiries relied principally upon the interviews of experts currently working in the field and that provided a valuable starting point from which to begin our research. Further research, however, should endeavor to gather and analyze more quantifiable data. We believe the implementation of a Lean Six Sigma analysis of various aspects of the project regarding the use of computer systems, paperwork records, and the use of manpower, etc., has the potential to yield significant results in the enhancement of the understanding of these processes, the potential benefits available to be gained, and the possible methods to realize them. Regardless of the questions remaining to be answered, it's clear that this analysis is worthwhile and will provide valuable contribution to reducing the burden the nation's defense places upon its budget.

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